

# *Parking*

*in the City Center*

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*Wilbur Smith and Associates*

NEW HAVEN, CONNECTICUT

PARKING  
IN THE  
CITY CENTER

*Prepared By*

*Wilbur Smith and Associates*

NEW HAVEN, CONNECTICUT

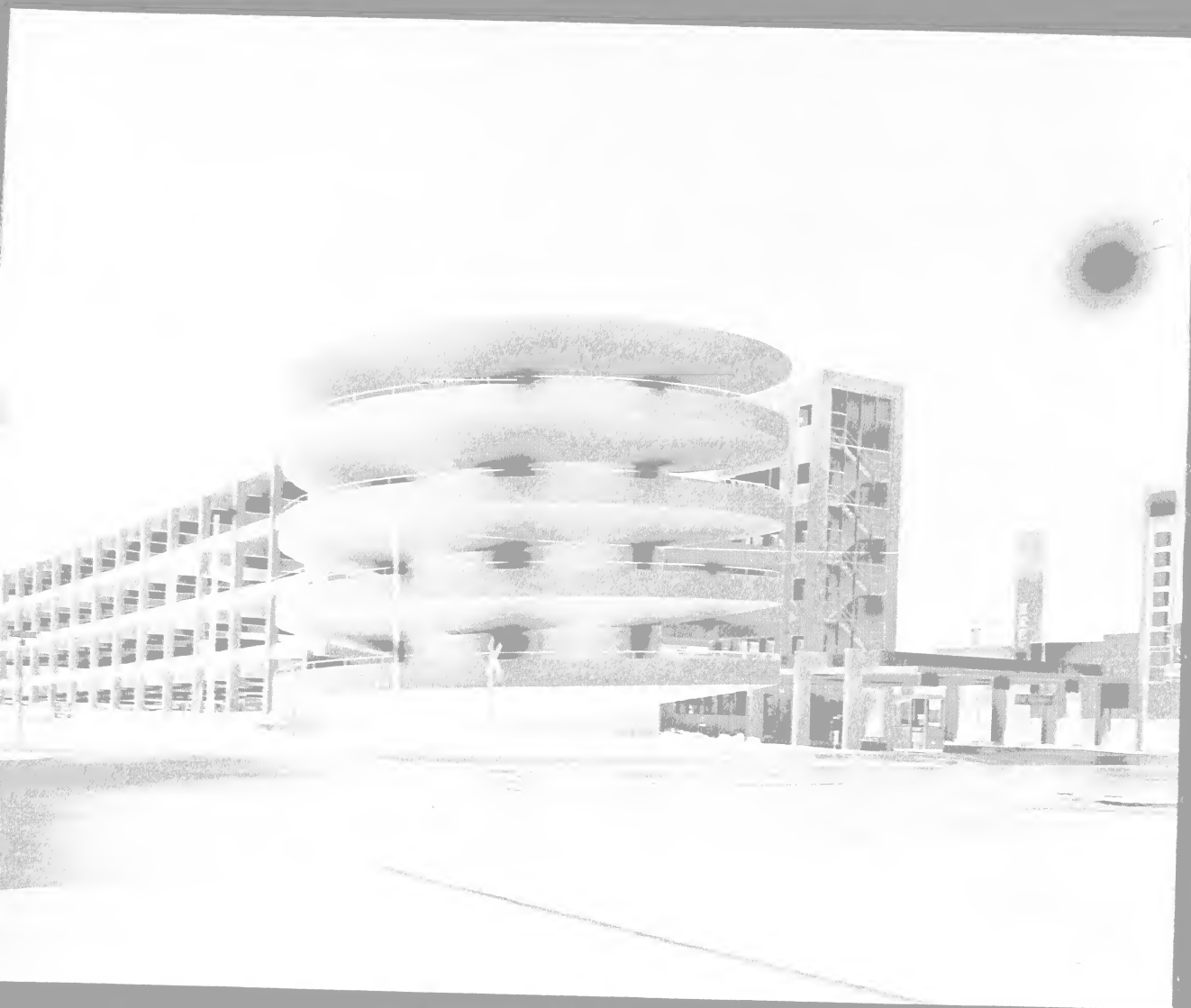
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OFF-STREET PARKING IN ROCHESTER, MINNESOTA, IS ENHANCED BY THIS NEW MODERN STRUCTURE PROVIDING 464 CONVENIENT SPACES. (PHOTO COURTESY OF NATIONAL GARAGES, INC.)



## FOREWORD

Transportation is one of the greatest challenges confronting the modern urban region. Few other issues have become so prominent, controversial, or long-term in their impact.

In response to the need for rational and objective approaches to urban transportation problems, the Automobile Manufacturers Association commissioned Wilbur Smith and Associates to study transportation within the modern metropolis. These findings are set forth in *Transportation and Parking in Tomorrow's Cities* — a detailed volume encompassing many facets of urban transportation planning.

*Parking in the City Center*, presented herein, is a major part of the comprehensive report. A guide to all concerned with downtown parking, it cites the various factors contributing to downtown parking demands, and shows how the nation's cities can meet these demands through various private and public approaches. The economic contributions of parking to the city center are indicated throughout the report.

No study of this magnitude could be accomplished without the assistance of a great many individuals, organizations, and agencies. These included the U. S. Bureau of Public Roads, the various state highway departments, city planning commissions, urban renewal agencies, and major downtown retail stores. We especially appreciate their assistance and cooperation.

WILBUR SMITH AND ASSOCIATES

MAY, 1965



HUMBLE OIL BUILDING AND GARAGE  
HOUSTON, TEXAS

## STUDY HIGHLIGHTS

The nation's urban centers are striving for a new equilibrium attuned to the motor vehicle — an adaptation essential for their continued prosperity and dominance. All cities are expanding their downtown parking supply to meet rising off-street parking demands. Even the central business districts of older cities attract an increasing number of visitors by car and are acquiring additional off-street parking.

Downtown's off-street parking demands have increased more rapidly than its daytime population, and reflect the increasing auto-orientation of both urban residents and downtown land uses. Parking indices — required spaces per thousand feet of gross floor area — average five for banks and bus depots; four for libraries, governmental buildings, and grocery stores; three for department stores; nearly two for offices; and less than one for furniture stores and hotels.

Supply and use of downtown parking spaces and characteristics of downtown parkers vary with city size — the more populous the city the higher the percentage of total spaces in garages. In larger cities, a higher proportion of downtown trips are made to or from work; consequently, average durations and walking distances are longer and parking turnover is less. The maximum accumulation of parkers occurs about noon in all cities.

Parking space needs depend on downtown's daytime population, the proportion of CBD trips made by automobile for work and non-work purposes, and public parking policies. Comparisons between parking space supply and "realized" demand (i.e. the number of parkers *actually* accommodated in the area) show a slight space surplus when the entire central business district is considered. Core areas of most CBD's, however, usually have a deficiency.

Because more downtown travelers will come from auto-oriented suburban areas in future years, downtown parking space demands and space needs will continue to rise in all cities. Thus, it has been established that by 1970 over 6,000 additional spaces will be required in Philadelphia's downtown core, as compared with 3,000 in 1960. Ten-year projections reveal that over 1,500 more spaces will be needed in cores of many medium-sized cities like Charlotte, Chattanooga, and Hartford.

Downtown parking space demands can be estimated from a "parking space factor" applied to central business district person trip destinations by auto. For an urbanized population of 100,000, approximately 0.16 spaces are desirable for each CBD destination by auto; when urban population reaches one million, 0.26 spaces are desirable for each destination.

The reasons for providing attractive downtown parking are apparent.

Parking has become a major factor in the success of many downtown enterprises. It is an important complementary land use, which reinforces the vitality of major activities, serves as an incentive to investment decisions, and is a dynamic force in shaping or directing new developments. It does *not* preempt prime land from major alternate uses. This is substantiated by special parking studies conducted in Los Angeles and Hartford. These studies indicate that parking *augments* rather than replaces commercial activities, such as department stores or hotels. Frequently, parking occupies vacant land or land previously in less productive use.

In replacing obsolete or unproductive buildings, parking lots provide an interim use of land. Also, core or "integral" parking garages appear increasingly valuable as investments, as adjuncts to special land uses, or as incentives for attracting new downtown investments.

Parking benefits are widespread. Many retail establishments indicate that convenient parking substantially increases their sales. Department stores in major cities frequently estimate the value of a parking space as the generator of up to \$10,000 in annual retail sales. Thus, if downtown parking is neglected downtown stores face a competitive disadvantage.

Moreover, elimination of downtown curb parking requires the provision of adequate off-street facilities. Inadequate parking precipitates illegal use of curbs, and, in turn, can adversely affect the entire central area traffic circulation.

Values associated with convenient access and parking for workers, shoppers, and other components of downtown's daytime population are increasingly recognized. Downtown parking has become a vital community concern — an integral part of the urban transport system.

Cities, therefore, have expanded their downtown space supply in recent years through various combinations of public and private approaches, although the vast bulk of all off-street parking in the United States has been developed by private enterprise.

Today, many parking facilities are being constructed to serve department stores, office buildings, and financial institutions. Even in cities with existing or proposed rapid transit, the number of downtown department stores for which convenient parking has been provided is continuing to rise.

In conjunction with freeways and urban renewal, multideck garages can both contain and reinforce downtown. By creating developmental pressure, or changing the relative position of selected locations, they can serve to increase downtown intensity.

In large mature cities, garage development often has been undertaken by public agencies, mainly because of land assembly problems. Cooperative

actions between public and private groups have proven successful in major cities like Pittsburgh, Buffalo, Detroit, San Francisco, and Los Angeles. In cities where downtowns are expanding to assume regional functions, such as Houston, Atlanta, and Dallas, private enterprise provides most off-street parking.

Most additional parking spaces have been developed in garages within recent years. This pattern is similar among cities of various population classes. Modern self-parking garages blend into the urban setting, and reflect the increasing selectivity of the central business district.

Parking developments result from the interplay of natural market forces on the use of downtown land. Generally an equilibrium is reached between parking supply and demand. As parking costs increase (from parking garage construction or urban renewal projects) demands for parking diminish (assuming other variables remain constant).

Within the central business districts of mature cities, such as Baltimore, approximately eight per cent of all downtown floor space (including ground area but excluding streets) is devoted to off-street parking. In automobile-oriented downtown centers, such as Los Angeles, this figure may rise to about 15 per cent. But even here, the vast bulk of downtown floor space is occupied by *other* uses.

This relationship suggests that ample parking can be provided for all of downtown's daytime population except for a fraction of the workers in larger cities. Thus, central cores can increasingly adapt to motor vehicles, even in mature central business districts. Moreover, it is highly improbable that *properly planned* parking facilities will unduly fragment downtown.

Costs, locations, and incomes of parking facilities are inherently sensitive to land values and space demands. Annual gross parking income per space has ranged upward to \$800 for garages located in the heart of downtown. Revenues for off-street spaces average slightly more than \$1.00 per space per day. Personnel costs usually average about \$0.25 per parked car for attendant parking facilities and less than \$0.15 for self-parking garages.

Construction costs, exclusive of land, range from \$1,500 to \$1,800 per space for conventional ramp garages, \$2,000 to \$3,000 for mechanical garages, and average \$4,000 (or more) per space for underground garages.

For land values below \$5 per square foot, parking lots are generally more economical per space than garages. Between \$5 and \$24, multideck garages cost less.

Downtown parking terminals should be planned concurrently with urban freeways and major downtown developments. Carefully planned downtown parking facilities can help achieve the desired functional segregation of pe-

destrian, auto, and service traffic within the city center. Self-parking multi-deck garages as integral parts of combined building-parking complexes and adjacent core-area developments, underground parking facilities, and garages built over streets or in relation to pedestrian malls, can further contribute to downtown's vitality and appearance.

Convenience and service aspects of parking should be emphasized, especially in larger cities. Accordingly, design and rate schedules of core area garages should encourage short-term parking, with facilities for all-day parkers located on the fringes of downtown. Sometimes, shuttle bus services may connect fringe parking with major activity concentrations.

The development of off-street parking facilities near outlying radial free-way interchanges and rapid transit or commuter railroad stations in larger urban areas will help afford maximum convenience to users and achieve more efficient use of trunk-line highway and transit routes. Such facilities are particularly desirable in urban regions of more than two million population, where they may equal about one third of the downtown parking supply. Their success requires fast and frequent express transit or highway service, short distance between parking lots and transit stops, easy access to and from major traffic arteries, ample parking capacity for downtown-oriented travelers, and reasonable parking costs. They often could be coordinated with commercial and civic developments at major interchange points.

Public agencies and private enterprise can work together in providing needed downtown parking. Most downtown parking garages can pay their way through such cooperative developments. Although public agencies could acquire and, in some cases, develop sites, operation by private interests should be encouraged as much as possible.

Moreover, there are a great many opportunities for parking developments by private enterprise as "combined facilities," adjuncts to business establishments, integral parts of renewal projects, or as purely speculative ventures. In fact, the majority of downtown garages probably could be developed as profit-making ventures with good likelihood of success. Parking meter revenues could be used to finance municipal garage construction.

In prospect, adequate downtown parking is important for the continued prosperity of the CBD, and for "balance" in its transport system.

# CONTENTS

	<i>Page</i>
<b>CHAPTER I — Introduction .....</b>	<b>1</b>
<b>CHAPTER II — Evaluating Downtown Parking Needs .....</b>	<b>3</b>
Parking Supply and Characteristics .....	3
Effects of Population on Space Supply .....	5
Effects of Population on Facility Type .....	7
Parking Rates .....	8
Usage .....	9
Purpose, Duration, and Walking Distance .....	9
Parking Generation .....	13
Parking Accumulation .....	13
Parking Demands and Space Needs in Typical Urban Areas .....	18
A Generalized Calibration of Downtown Parking Demands .....	19
<b>CHAPTER III — Downtown Parking Economics .....</b>	<b>23</b>
Parking Benefits to CBD Land .....	23
Parking Stimulates Downtown Investment .....	25
Direct Values of Off-Street Parking .....	26
Land Use and Parking .....	30
Meeting Downtown Parking Needs .....	30
Public and Private Developments .....	31
Changes in Facility Development .....	31
Economic Equilibrium in Off-Street Parking .....	31
Costs and Revenues of Downtown Parking Developments .....	35
Effect of Land Costs .....	35
Cost-Income Comparisons .....	38
Municipal Financing .....	43
Private Financing .....	44
Opportunities for Private Development .....	45
<b>CHAPTER IV — Recent Trends in Off-Street Parking .....</b>	<b>51</b>
Typical Development Programs .....	51
Baltimore .....	51
Houston .....	52
Minneapolis .....	52

## CONTENTS (Continued)

	<i>Page</i>
Pittsburgh.....	53
San Francisco.....	54
Washington, D. C.....	55
Design Concepts.....	55
Self-Parking.....	55
Combination Facilities .....	55
Connections.....	56
Coordination With Freeways.....	56
Garage Types.....	56
Underground Facilities.....	56
Mechanical Garages.....	57
Ramp Garages.....	57
Design Standards.....	57
Entrance and Exit Lanes.....	59
Unit Parking Dimensions.....	59
Column Spacing and Clear-Span Construction .....	59
Floor Heights.....	60
Ramp Grades.....	60
Lighting Intensity .....	60
<b>CHAPTER V – Parking Policy and Downtown Transportation Planning . . .</b>	<b>61</b>
Encouraging Short-Term Parking.....	61
Coordinating Parking With Transport Terminals.....	63
Zoning for Parking.....	64
Residential Parking.....	64
Institutional Parking.....	66
Commercial Parking.....	66
Airport Parking.....	67
Cooperative Parking Developments.....	67
Enhancing Parking Facility Design.....	68
<b>CHAPTER VI – Case Studies in Downtown Parking .....</b>	<b>71</b>
Los Angeles.....	71
Regional Setting.....	71
Economic and Historical Development Influences .....	74
Changes in Location of Activity.....	75
Floor Space.....	75



## CONTENTS (Continued)

	Page
Retail Sales .....	75
Assessment Policies.....	78
Demolition of Obsolete Buildings .....	78
Off-Street Parking Trends and Characteristics .....	79
Traffic and Parking Magnitudes .....	80
Off-Street Parking 1956 and 1961.....	81
Spatial Patterns of Parking Supply.....	82
Parking Rates .....	86
Parking Space Needs .....	87
Parking As An Economic Use of Downtown Land.....	88
The Parking Lot Operator.....	88
Retail Business Establishments.....	88
Benefits to the City .....	88
Parking and the Future of Downtown.....	89
Prospects for Intensification .....	89
Transportation Planning Implications .....	91
Hartford.....	92
Regional Setting .....	92
Off-Street Parking Trends and Characteristics .....	96
Parking Trends .....	96
Present Space Supply.....	96
Parking Rates.....	99
Parking Characteristics .....	101
Parking Space Needs.....	101
Economics of Recent Parking Developments.....	102
G. Fox and Company Garage.....	102
Municipal Church Street Garage .....	105
Pigeon Hole Garage .....	107
Constitution Plaza Garages.....	107
Economic Values of Parking .....	107
Parking and the Future of Downtown.....	109
Summary of Similarities and Differences ....	109
Generalization and Extension.....	111
APPENDICES.....	113
Appendix A — Parking Characteristics in Selected Cities.....	115
Appendix B — Additional Tables — Parking in Los Angeles and Hartford .....	129
BIBLIOGRAPHY.....	139
INDEX.....	143

## ILLUSTRATIONS

<i>Figure No.</i>		<i>Page</i>
1	Central Business District Parking Spaces in Relation to Urbanized Area Population .....	4
2	Central Business District Parking Spaces per Registered Vehicle, 1960.....	5
3	Parking Spaces per Square Mile of Central Business District .....	6
4	Distribution of Central Business District Parking Spaces by Type of Facility .....	6
5	Off-Street Parking Spaces in Relation to Urbanized Area Population .....	7
6	Parking Rate Contours in Typical Central Business Districts.....	10
7	Daily Parkers in Relation to Urbanized Area Population .....	11
8	Trip Purposes of Parkers in Relation to Urbanized Area Population .....	11
9	Parking Turnover in Relation to Urbanized Area Population .....	12
10	Average Parking Durations in Relation to Urbanized Area Population.....	13
11	Average Walking Distances in Relation to Urbanized Area Population .....	14
12	Parking Accumulation by Trip Purpose, New Orleans, 1960 .....	16
13	Maximum Parking Accumulation in Relation to Urbanized Area Population.....	18
14	Parking Space Demand Factor.....	21
15	Typical Downtown Parking Facility Patterns.....	24
16	Philadelphia's Parking Facility Patterns .....	25
17	Off-Street Parking Development, New Orleans.....	32
18	Economic Equilibrium of Off-Street Parking (Hypothetical).....	34
19	Parking Space Costs in Relation to Land Values.....	36
20	Annual Garage Operating Costs .....	41
21	Required Cost per Parker.....	46
22	Parking Garage Development, Pittsburgh.....	53
23	Typical Sloping Floor Garage Designs.....	58
24	Typical Ramp Garage Designs .....	58
25	Average Parking Rates for Municipal Garages.....	62
26	Central City Area, Los Angeles, California .....	73
27	Land Development in Los Angeles Central Business District, 1930 ...	74
28	Trends in Land Development, Downtown Los Angeles.....	75
29	Los Angeles Central Business District Building Area in Relation to Population.....	77
30	Trends in Gross Building Area by Type of Space, Los Angeles Central Business District, 1900-1955.....	78
31	Location of Demolitions, Los Angeles Central Business District, 1945-1960.....	80

## ILLUSTRATIONS (Continued)

<i>Figure No.</i>		<i>Page</i>
32	Trends in Off-Street Parking Space, Los Angeles Central Business District, 1900-1960 .....	81
33	Changes in Parking and Land Use for Selected Blocks, Los Angeles Central Business District, 1930-1948-1960.....	82
34	Parking Garages, Downtown Los Angeles, 1962 .....	84
35	Changes in Central Business District Parking Supply by Block, 1956-1961 .....	85
36	Hourly Parking Rates and Assessed Land Valuation, Los Angeles Central Business District, 1960-1961.....	86
37	Parking Use-Demands-Needs, Downtown Los Angeles, 1957.....	87
38	New Construction, 1945-1960, Central City Area.....	90
39	Suggested Model for Proposed Bunker Hill Urban Renewal Project.....	91
40	Hartford Central Business District .....	93
41	Age of Structures, Central Business District, Hartford, Connecticut.....	95
42	Trend and Distribution of Downtown Parking Spaces, Hartford, Connecticut.....	96
43	Changes in Parking Supply, Central Business District, Hartford, Connecticut .....	97
44	Principal Off-Street Parking Facilities, Central Business District, Hartford, Connecticut, 1963 .....	98
45	Daily Parking Rates as Related to Assessed Land Value, Hartford, Connecticut .....	100
46	Influence Areas of Off-Street Parking Facilities, Central Business District, Hartford, Connecticut .....	103
47	Variations in Parking Garage Use, Two Garages, Hartford, Connecticut.....	106
48	Rendering of Constitution Plaza, Hartford, Connecticut.....	108
49	Major Redevelopment Projects in Relation to Expressway, Arterial, and Parking Facilities, Central Business District, Hartford, Connecticut.....	110

## PHOTOGRAPHS

Off-Street Parking Garage, Rochester, Minnesota .....	Frontispiece
Humble Oil Building and Garage, Houston, Texas.....	ii
Temple Street Garage, New Haven, Connecticut .....	27
Bon Marche, Seattle, Washington .....	28
Midtown Parking Center, Wilmington, Delaware .....	37
AT & T Building, Kansas City, Missouri .....	39
Macy's Store & Garage, Queens, New York.....	69

# TABULATIONS

<i>Table</i>	<i>Page</i>
1 Average Parking Rates, Selected Central Business Districts.....	8
2 Parking Fee and Trip Purpose in Three Central Business Districts.....	9
3 Average Parking Space Requirements for Selected Downtown Establishments.....	15
4 Peak Parking Accumulation in Relation to Total Daily Parkers, Selected Central Business Districts.....	17
5 Peak Parking Accumulation for Various Trip Purposes in Relation to Total Daily Parkers, Selected Central Business Districts.....	17
6 Existing and Projected Parking Space Surpluses and Deficiencies, Selected Central Business Districts.....	20
7 Comparison of Downtown Shopper Travel Modes in Selected Cities.....	28
8 Typical Downtown Department Stores With Adjacent Off-Street Parking Facilities.....	29
9 Recent Changes in Off-Street Parking Spaces, Selected Central Business Districts.....	33
10 Contribution of Retail Stores to Annual Income, Midtown Parking Center, Wilmington, Delaware.....	38
11 Annual Cost-Income Data for 18 Selected Municipal Garages.....	40
12 Comparative Operating-Cost Data for Typical 800-Space Garage.....	42
13 Cost-Income Summary, Midtown Parking Center, Wilmington, Delaware.....	43
14 Comparative Public and Private Development of Two Typical Garages.....	47
15 Cost-Income Comparisons, Average of 18 Municipally Developed Garages.....	48
16 Suggested Unit Parking Dimensions.....	59
17 Estimated Outlying Parking Requirements Along Freeways or Rapid Transit Routes.....	64
18 Typical Zoning Requirements, Indicated Parking Space Needs, and Suggested Planning Standards.....	65
19 Characteristics of Los Angeles Central City Area, 1961.....	72
20 Net Floor Area Change by Use Category, Los Angeles Central Business District, Selected Years, 1930-1980.....	76
21 Percentage of Los Angeles CBD Floor Space Devoted to Parking.....	77
22 Assessed Valuation of Land and Improvements, Los Angeles Central Business District, Selected Years, 1931-1960.....	79
23 Off-Street Parking Spaces Downtown Los Angeles, 1956-1961.....	83

## TABULATIONS (Continued)

<i>Table</i>	<i>Page</i>
24 Land Areas Occupied by Off-Street Parking, Major Subareas, Los Angeles Central Business District, 1961.....	84
25 Distribution of Land Use, Floor Area and Assessment, Downtown Hartford, 1962 .....	94
26 Parking Spaces, Downtown Hartford, 1963 .....	99
27 Ownership of Parking Facilities, Downtown Hartford, 1963 .....	100
28 Characteristic of Parkers, Hartford Central Business District, 1961.....	101
29 Rate Structure in Selected Parking Garages, Downtown Hartford, 1963.....	102
30 Comparison of G. Fox and Municipal Garages, Downtown Hartford .....	104
31 Growth in Daily Parkers, G. Fox and Company Garage, Downtown Hartford.....	104
32 Effect of Enlarging G. Fox Parking Garage on Daily Parkers, Downtown Hartford .....	105

## APPENDIX TABULATIONS

<i>Table</i>	<i>Page</i>
A-1 Detailed Parking Characteristics for Selected Urban Areas .....	117
A-2 Parking Accumulation and Trip Purpose, New Orleans Central Business District, Typical 1960 Weekday 10:00 A. M. - 6:00 P. M. ....	121
A-3 Shopper Purchases Related to Travel Mode, Chattanooga and Knoxville, Tennessee, 1961.....	121
A-4 Trends in Total Off-Street Parking Spaces, Houston Central Business District.....	122
A-5 Summary of Building Requirements in Various Cities Relating to Parking Structures.....	123
A-6 Construction Cost Data for Typical Self-Service Parking Garages.....	124
A-7 Physical and Financial Facts Regarding San Francisco Garages, 1959.....	125
A-8 Summary of Unit Parking Demands for Private Residences, Motels, and Hotels, Los Angeles, 1962.....	126
A-9 Residential Parking Demands, Philadelphia, 1957.....	127

## APPENDIX TABULATIONS (Continued)

<i>Table</i>	<i>Page</i>
A-10 Origin Modes of Central Business District Workers, Chicago, 1956.....	127
B-1 Los Angeles City Central Business District Retail Sales as a Percentage of Total Metropolitan Area Sales, Selected Years, 1929 to 1959 .....	131
B-2 Department Store Sales in Downtown Los Angeles, 1929 to 1959.....	131
B-3 Summary of Zoning Regulations, City of Los Angeles.....	132
B-4 Building Demolitions, Los Angeles Central Business District, 1930-1955 .....	133
B-5 Parking as a Result of Demolitions, Downtown Los Angeles, 1956-1961.....	133
B-6 Los Angeles CBD Parking Garages Constructed Since 1955.....	134
B-7 Location, Average Rent, and Age of Buildings in Downtown Los Angeles, 1958 .....	135
B-8 Typical Feasibility Calculation Parking Facility Located Eight Blocks North of High-Land-Value Intersection, Downtown Los Angeles .....	136
B-9 Annual Income from Parking Lots, Los Angeles .....	136
B-10 Analysis of Downtown Property Sales, Hartford, 1954-1959 .....	137
B-11 Summary of Hartford Redevelopment Program .....	137
B-12 Anticipated Changes in Taxables, Hartford, Connecticut, 1960-65 .....	138

# I. INTRODUCTION

Everyone in the modern city at one time or another has become keenly aware of the "parking problem." Parking needs have developed wherever people congregate — a response to the continued popularity of the motor vehicle.

In consequence, parking has become a major urban land use. Today, extensive off-street parking areas are provided at university and college campuses, airports, stadiums, athletic fields, industrial parks, civic centers, shopping districts, concentrated residential neighborhoods, and at change of mode points within urban transportation systems. Parking has become essential in the design and location of major buildings and activity centers, and is usually prerequisite to their development.

Parking needs, however, are most important in the central business district (CBD). Here is the urban region's focus and principal activity center. Generally encompassing an area of less than one square mile, it may contribute as much as one fifth of the city's tax base.

Emergence of major outlying centers in the years following World War II has often precipitated a relative, sometimes absolute, decline in CBD activity. To counter this decline, cities throughout the nation are revitalizing their downtown areas. Continued downtown vitality generally requires that visitors be attracted from an ever-widening urban region. Many of these visitors, in turn, *must* travel by car to and from the CBD.

Parking's value to the urban core results directly from these changing travel preferences and needs of urban residents. Downtown's off-street parking demands have risen more rapidly than its daytime population, as urban travelers place greater reliance on motor vehicle travel, and as a higher proportion of CBD trips are made by car. Even the downtowns in older cities (where visitation has held steady) attract an increasing number of visitors by car and are acquiring additional off-street parking.

In every city, necessary reductions in downtown street space used for curb parking have also increased off-street demands; and, as cities become larger, workers constitute a rising proportion of downtown's daytime population, resulting in a corresponding rise in the proportion of all-day CBD parking.

The national investment in parking and related real estate has paralleled the growth in demands, totaling slightly under five billion dollars in 1961, as compared with one billion dollars in 1947. In 1961, there were over 13,000 off-street parking facilities, including 11,700 surface lots and 2,300 ramp or

mechanical garages, in downtown areas. About 94 per cent of all current off-street parking is the result of investment by private enterprise.<sup>1</sup>

Today, there is more than one full-time employee per 100 off-street spaces. Over 36,000 persons are employed in the industry with an annual payroll exceeding \$100 million.<sup>2</sup>

Thus, as they adapt to the motor age, the nation's downtown areas are rapidly expanding their off-street parking. Central business district parking *completes* the transport system focused on the city center and thereby assumes major importance in the total transportation plan. Downtown parking, therefore, has become a vital community concern. It is an important downtown function, a necessary corollary to other activities, and a legitimate business in itself. It has impact on motorists (workers, shoppers, and businessmen), establishments that attract motorists (stores and employers), owners of land used for parking, off-street parking operators, and the local government interested in preserving downtown property values.<sup>3</sup>

Accompanying this diversity of interests is a wide variety of views on how best to "solve the downtown parking problem." Hence, many basic questions arise regarding off-street parking's role in the modern city center: How much parking do various-sized downtown areas need? Where should additional parking be provided, and who should develop it? How will additional parking benefit downtown? Is parking an "economical" use of land, or does it merely pre-empt land from more "important" uses? Are there limits to the amount of additional downtown parking space that can be provided? And to what extent can off-street parking pay for itself?

This report seeks answers to such basic questions. It appraises the place of downtown parking in the urban transportation system; shows how parking needs relate to city size and economy; estimates the desired amounts of downtown parking; evaluates the economic aspects of downtown parking; and suggests basic directions for downtown parking policy.

In most cities today, provision of downtown parking means off-street parking. This is because downtown streets must increasingly serve the movement rather than the storage of vehicles. For this reason, primary emphasis is given to off-street parking within the nation's central-city cores.

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<sup>1</sup>Source: National Parking Association, Washington, D. C.

<sup>2</sup>According to the *Census of Business*, U. S. Department of Commerce, there were approximately 11,000 privately owned and operated parking facilities in 1958, compared with 8,600 in 1954 — an increase of 28 per cent. During this period, automobile registrations increased only 17 per cent.

<sup>3</sup>F. H. Wynn, *Downtown Off-Street Parking: Economics and Techniques*, presented at the AMA Symposium on Urban Transportation, Detroit, Michigan, October, 1962.



## II. EVALUATING DOWNTOWN PARKING NEEDS

Parking space requirements for the nation's city centers can be predicted with reasonable accuracy, once the important factors influencing parking demands are identified and assessed. These factors relate closely to city size, downtown intensity and land use, and vehicle ownership. Parking characteristics, patterns, and demands are surprisingly similar among cities in the same population groupings.

This consistent behavior of parkers suggests a systematic approach to the dimensioning of downtown's parking needs. The existing parking space supply provides the logical point of departure. In turn, parking characteristics and habits reflect the socio-economic aspects of downtown parkers, and provide bases for evaluating locations and usage of proposed facilities. Finally, supply-demand comparisons serve to measure parking space deficiencies and needs.

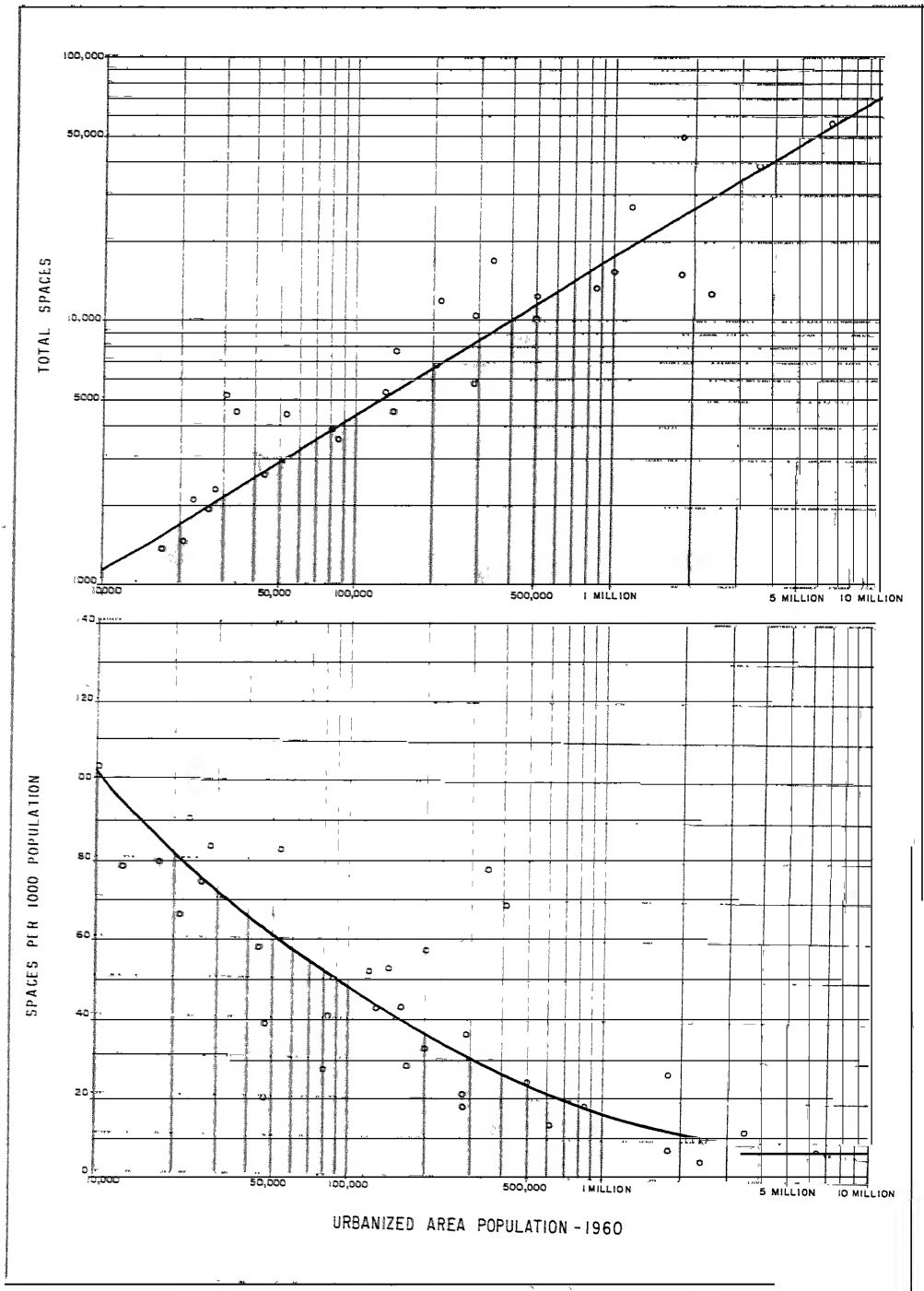
Such information is an outgrowth of downtown parking surveys conducted in many of the nation's cities. These surveys are essential for the intelligent planning of off-street facilities, and include inventories of existing curb, lot, and garage spaces. Motorists are interviewed to obtain information on length of stay, distances walked, trip purposes, average fee paid, origin of trip, place of parking, and downtown destination. The block-by-block assessment of demands and deficiencies is a straight-forward process, once the survey is completed.<sup>4</sup>

### Parking Supply and Characteristics

Downtown parking spaces may be classified by type of facility — curb and off-street (lot or garage), location (core or fringe), and fee structure. Facilities may be further divided into self-parking or attendant operated, or considered by type of ownership — whether publicly owned and operated, publicly owned and leased for private operation, or privately owned and operated. They may be operated either as an adjunct to another business (where there is mutual benefit), or as an individual enterprise.

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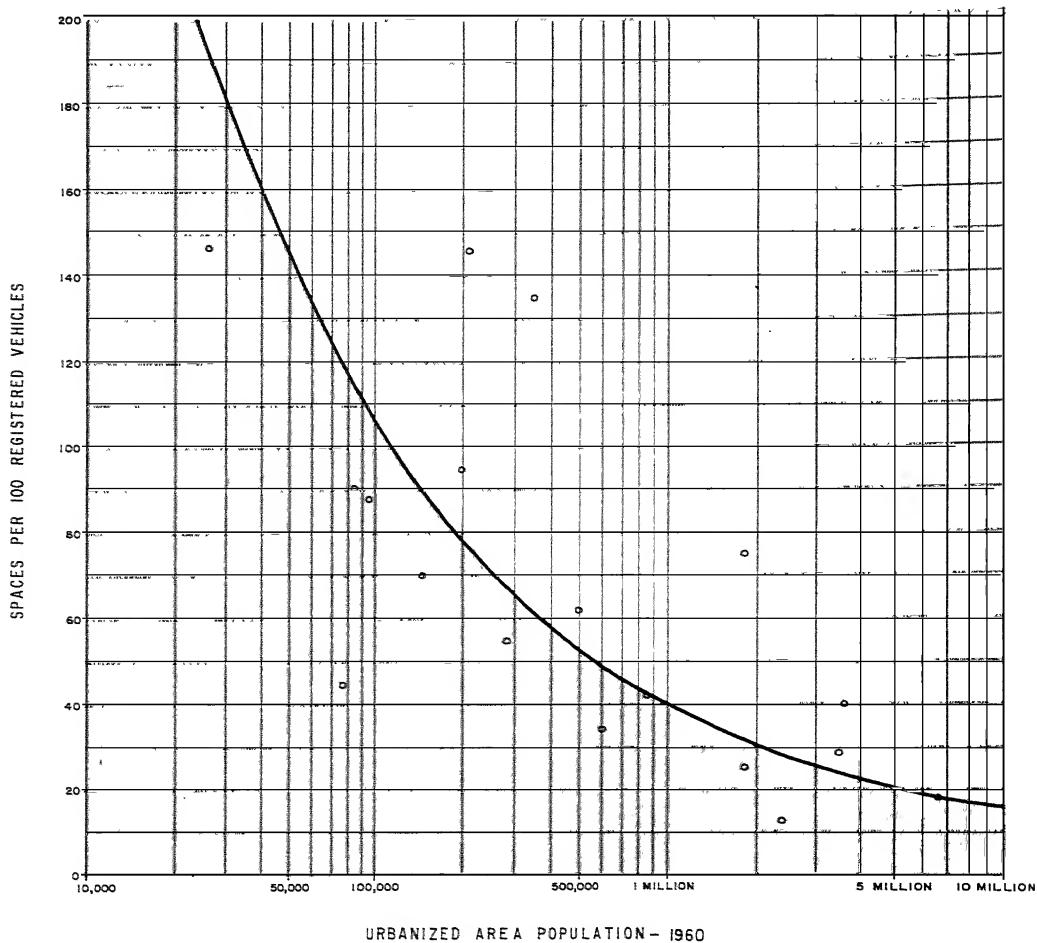
<sup>4</sup>Relationships set forth herein are based on information obtained from parking studies conducted between 1955 and 1963. They generally confirm patterns developed by the U. S. Bureau of Public Roads based on parking studies conducted between 1946-1954. See: *Parking Guide for Cities*, U. S. Department of Commerce, Bureau of Public Roads, Washington, D. C., 1956; R. H. Burrage and E. G. Mogren, *Parking*, The Eno Foundation for Highway Traffic Control, Saugatuck, Conn., 1957. A sociological and generalized discussion of parking is given by G. Baker and B. Funaro in *Parking*, Reinhold Publishing Corp., New York, N. Y., 1958. Emphasis on parking in European cities is presented by J. Brierly in *Parking of Motor Vehicles*, C. R. Books Limited, Lennox House, London, 1962. The present study focuses primarily on the economic aspects of parking as they relate to urban transportation system planning.



**FIGURE 1**  
 CENTRAL BUSINESS DISTRICT PARKING SPACES  
 IN RELATION TO URBANIZED AREA POPULATION

**Effects of Population on Space Supply** — The effects of urban population on downtown parking space supply are shown in Figure 1. Urbanized areas with the same population generally have about the same amount of parking space.

Total CBD spaces increase as urban areas get larger, but at a diminishing rate. Downtown parking spaces currently approximate 4,500 when urbanized area population is 100,000 and about 18,000 when this population reaches one million. (These space requirements will probably increase in the future.) The



**FIGURE 2**  
CENTRAL BUSINESS DISTRICT PARKING SPACES  
PER REGISTERED VEHICLE, 1960

The spaces per registered vehicle decline as the urban area increases in population. When urbanized area population approximates 100,000, central business district parking spaces approximate 110 per 1,000 registered vehicles. When the urbanized area reaches one million people, there are approximately 40 spaces per registered vehicle. For Los Angeles (with an urbanized area population of six million) there are only 18 spaces per 1,000 registered vehicles.

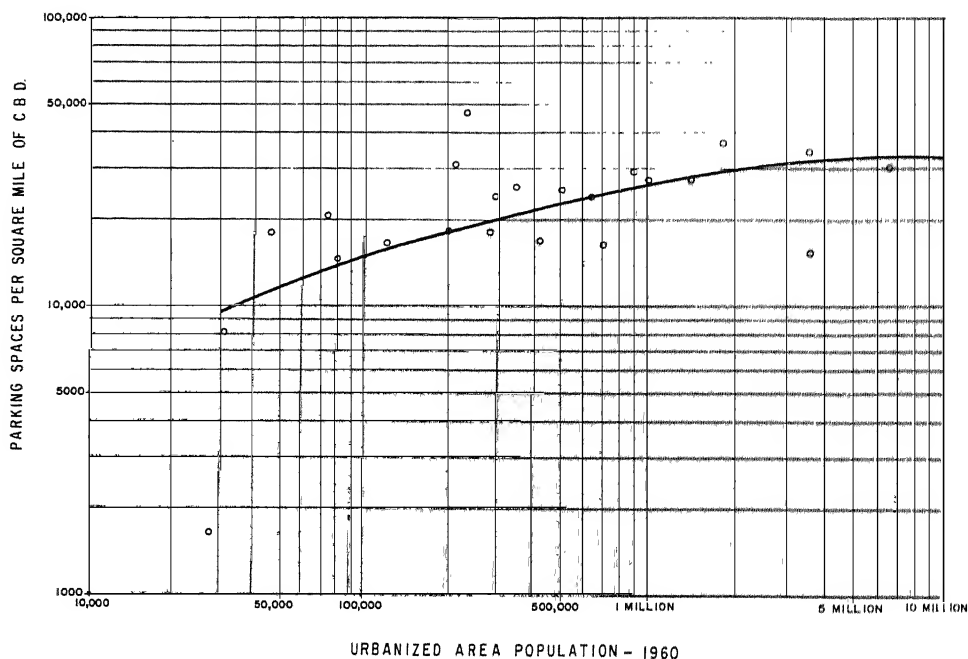


FIGURE 3

#### PARKING SPACES PER SQUARE MILE OF CENTRAL BUSINESS DISTRICT

On a square-mile basis, the number of downtown spaces increases gradually as urban population rises. Parking spaces per square mile of downtown approximate 15,000 for urban populations of 100,000, and 23,000 for urban populations of 500,000. When urbanized areas approach two million, parking spaces per square mile level off at about 30,000.

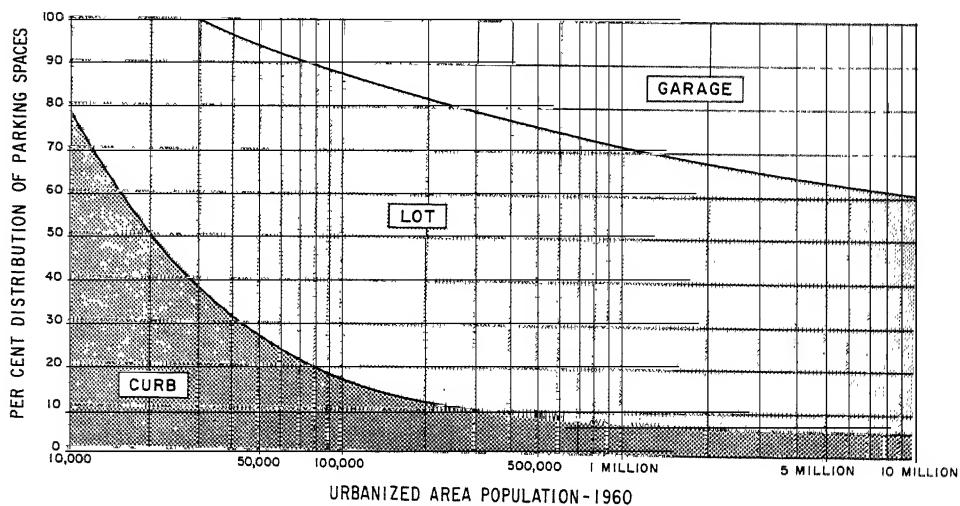


FIGURE 4

#### DISTRIBUTION OF CENTRAL BUSINESS DISTRICT PARKING SPACES BY TYPE OF FACILITY

lesser per capita supply of downtown parking in larger cities results from several factors. There is less relative per capita CBD trip attraction; public transportation generally carries a greater percentage of people downtown, and high land costs may discourage core area off-street parking developments.

**Effects of Population on Facility Type** — Although curb space dominates the parking supply in smaller cities, it becomes a smaller proportion of the total as urban population rises. (Until recently, most downtown garages were constructed only in larger cities.)

As depicted in Figure 4, urban areas of 100,000 population have approxi-

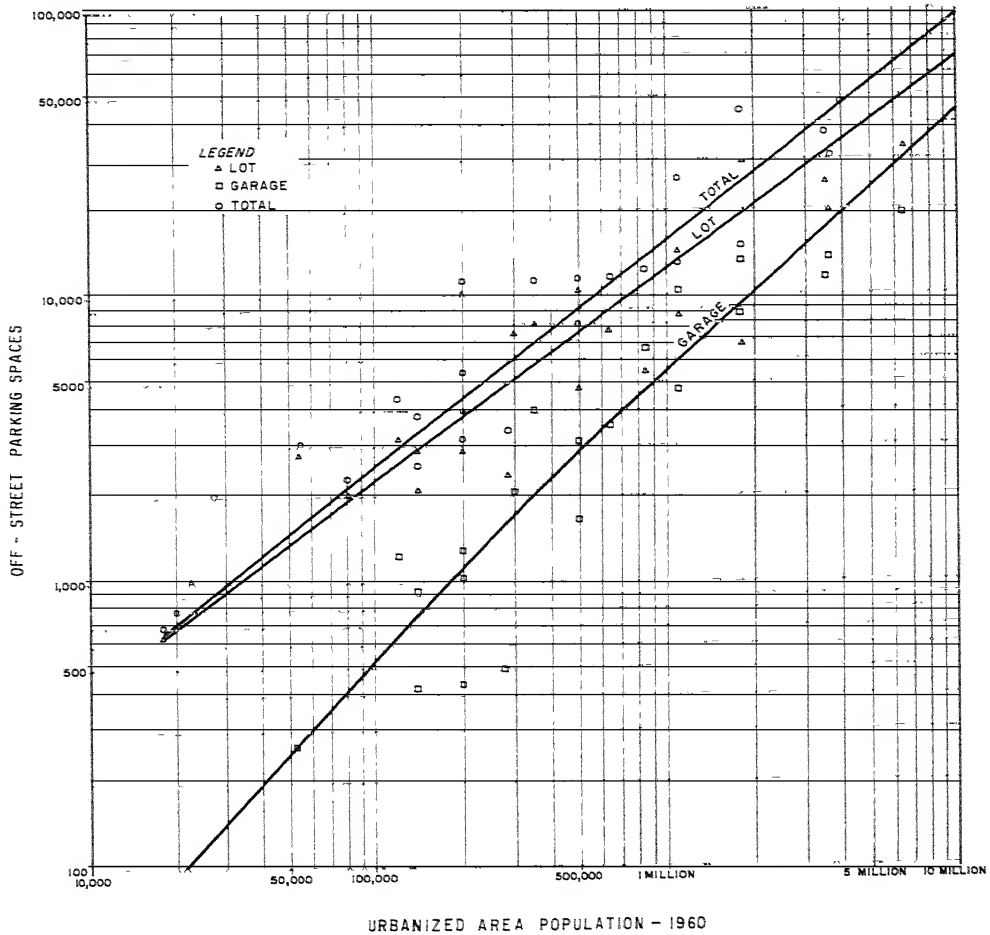


FIGURE 5

#### OFF-STREET PARKING SPACES IN RELATION TO URBANIZED AREA POPULATION

As urban areas increase in size, the number of garage spaces increases at a faster rate than parking lot spaces. Central business districts in urbanized areas of 200,000 or less usually have fewer than 1,000 spaces in parking garages. This number increases substantially as urban areas enlarge; there are about 5,500 garage spaces in urban areas of one million in population. The total off-street spaces averaged 2,800 in urbanized areas of 100,000, 16,000 in areas of one million, and about 28,000 in urbanized areas of two million population.

mately 18 per cent of the total parking supply along curbs, 67 per cent in lots, and 15 per cent in garages. In contrast, when urban population reaches one million, only eight per cent of the total spaces are found along curbs, while 65 per cent are in lots and 27 per cent in garages.

**Parking Rates** — Downtown parking rates also rise as urban population increases — thus, they usually are higher in large cities. Illustrative examples of this variation for eight selected cities are shown in Table 1. The first hour of parking costs approximately 30 cents in cities of 300,000 population or less, nearly 40 cents per hour in intermediate-sized cities, and over 50 cents in large cities like Philadelphia.

Average all-day rates vary more widely. They range from 46 cents in Charlotte to \$1.10 per day in Philadelphia. They average nearly \$2.00 in Chicago and substantially more in New York City. Thus, rates appear highest in transit-oriented cities where parking near major activity centers is often at a premium because of competing land uses.<sup>5</sup>

<sup>5</sup>Since choice of travel mode is influenced by comparative cost factors, high all-day parking rates may discourage automobile usage.

TABLE 1  
AVERAGE PARKING RATES  
Selected Central Business Districts

URBAN AREA	STUDY YEAR	1960 URBANIZED AREA POPULATION	AVERAGE PARKING RATES	
			One Hour	All Day
Philadelphia, Pa.....	1957	3,635,228	\$0.54	\$1.10
Pittsburgh, Pa.....	1955	1,804,400	0.31	0.90
New Orleans, La.....	1960	845,237	0.40	0.91
Hartford, Conn.....	1961	381,619	0.36	0.81
Nashville, Tenn.....	1961	346,729	0.28	0.67
Grand Rapids, Mich.....	1956	294,230	0.30	0.82
Charlotte, N. C.....	1961	209,551	0.29	0.46
Chattanooga, Tenn.....	1960	205,143	0.27	0.57

SOURCE: Comprehensive parking studies in each urban area.

TABLE 2  
PARKING FEE AND TRIP PURPOSE IN THREE CENTRAL  
BUSINESS DISTRICTS

URBAN AREA	TRIP PURPOSE AND AVERAGE FEE PAID			
	<u>Shopping</u>	<u>Business</u>	<u>Work</u>	<u>Other</u>
New Orleans, La.....	\$0.50	\$0.42	\$0.77	\$0.49
Nashville, Tenn.....	0.34	0.21	0.51	0.24
Chattanooga, Tenn.....	0.28	0.17	0.43	0.20

SOURCE: Comprehensive parking studies in each urban area.

The fees actually paid by parkers relate to both city size and trip purpose. The larger the city, the higher the fee in all purpose categories. As shown by Table 2, workers paid the highest average parking fee in each of three typical cities. Although shoppers actually paid higher *hourly* fees, their stay was usually shorter, resulting in lower over-all charges. Similarly, people parking for business purposes paid somewhat lower total fees than shoppers, largely because of short durations; yet they often parked in the most convenient and costly locations.

In all cities, downtown parking rates are highest near core areas, and generally diminish as downtown land-use intensity and assessed valuation decrease (Figure 6). This is because rates commonly reflect locations of major parking facilities as they relate to principal business establishments.

**Usage** — Total daily CBD parkers increase as urban population gets larger, but at a diminishing rate. A ten-fold increase in population results in a 2.5 increase in daily parkers. As shown in Figure 7, daily parkers approximate 14,000 in urban areas of 100,000 population and 36,000 in urban areas of one million. Philadelphia, with a 1960 urbanized area of about 3.6 million, had approximately 66,000 parkers daily.

Many outlying centers in or near major metropolitan areas also generate high parking demands. Beverly Hills, California (1960 population, 30,817), parks over 40,000 vehicles per day, a number equivalent to that for the downtown district serving a city of one million.

**Purpose, Duration, and Walking Distance** — The great variety of parkers' trip purposes clearly denote the changing mix of downtown land use in large cities and the influence of regional office functions. As urban population rises, work trips increase in proportion, shopping trips diminish, and other purpose categories remain stable (Figure 8).

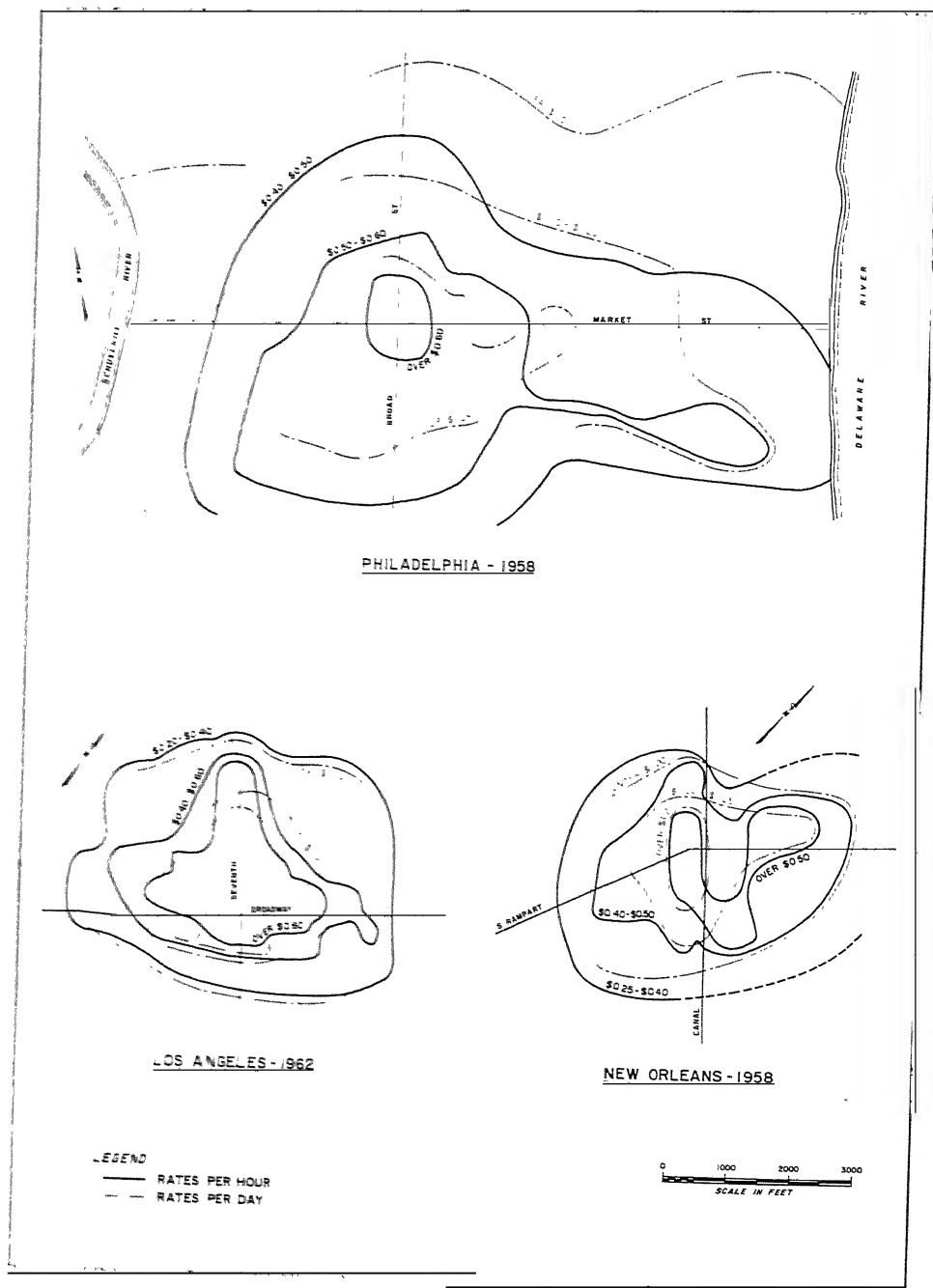


FIGURE 6

# PARKING RATE CONTOURS IN TYPICAL CENTRAL BUSINESS DISTRICTS

This drawing shows parking fee contours for Philadelphia, New Orleans, and Los Angeles to the same distance scale. The highest parking rates generally are near areas of high land intensity, along Market and Chestnut Streets in Philadelphia, along Canal Street in New Orleans, and along Broadway and Seventh Streets in Los Angeles. The rate contours diminish as the supply of parking increases, and as downtown land use becomes less intense.



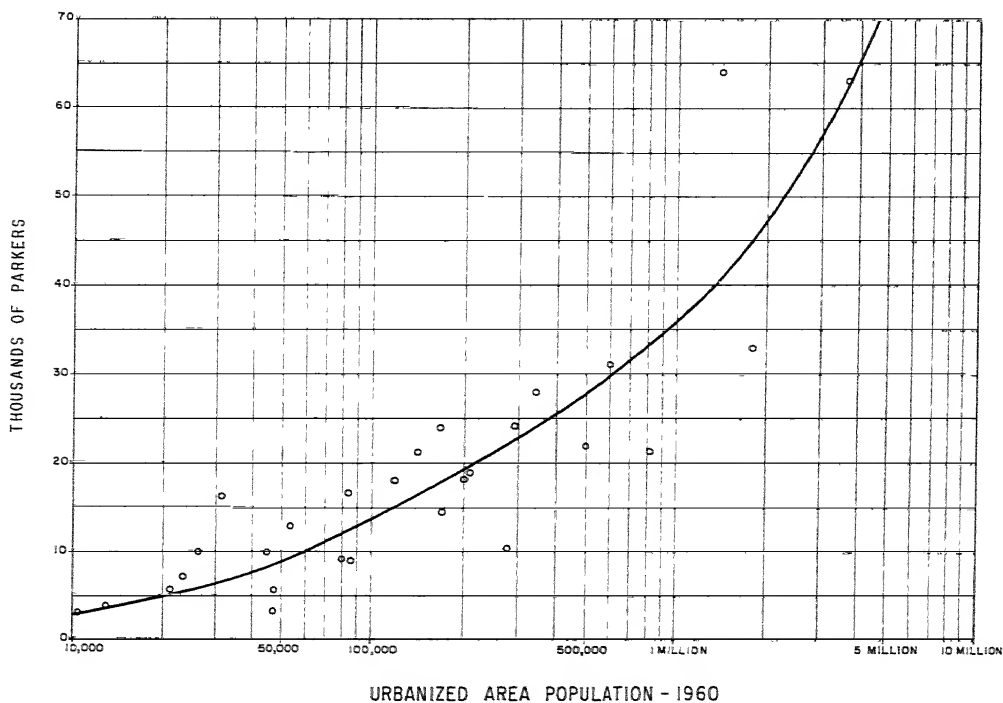


FIGURE 7

### DAILY PARKERS IN RELATION TO URBANIZED AREA POPULATION

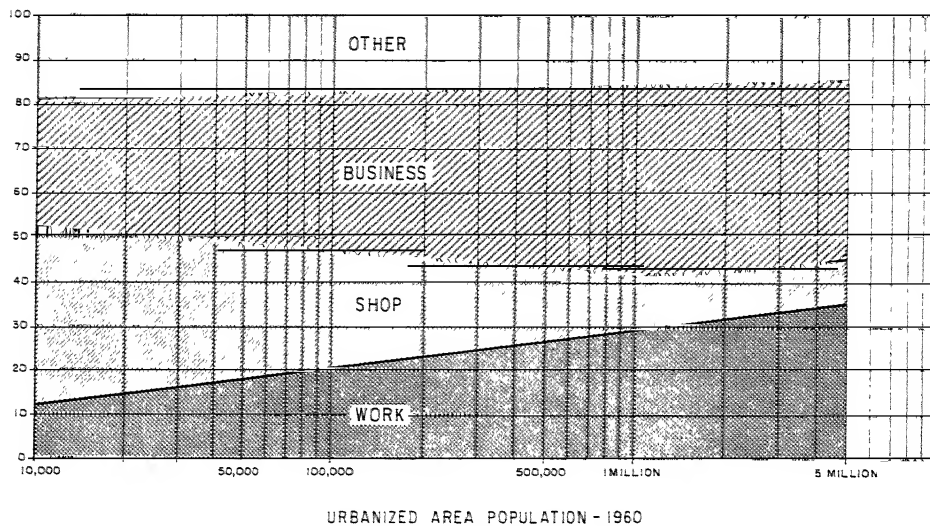


FIGURE 8

### TRIP PURPOSES OF PARKERS IN RELATION TO URBANIZED AREA POPULATION

Note that the proportion of parkers going to work increases from about 20 per cent in urban areas under 100,000, to over 30 per cent in urban areas exceeding one million population.

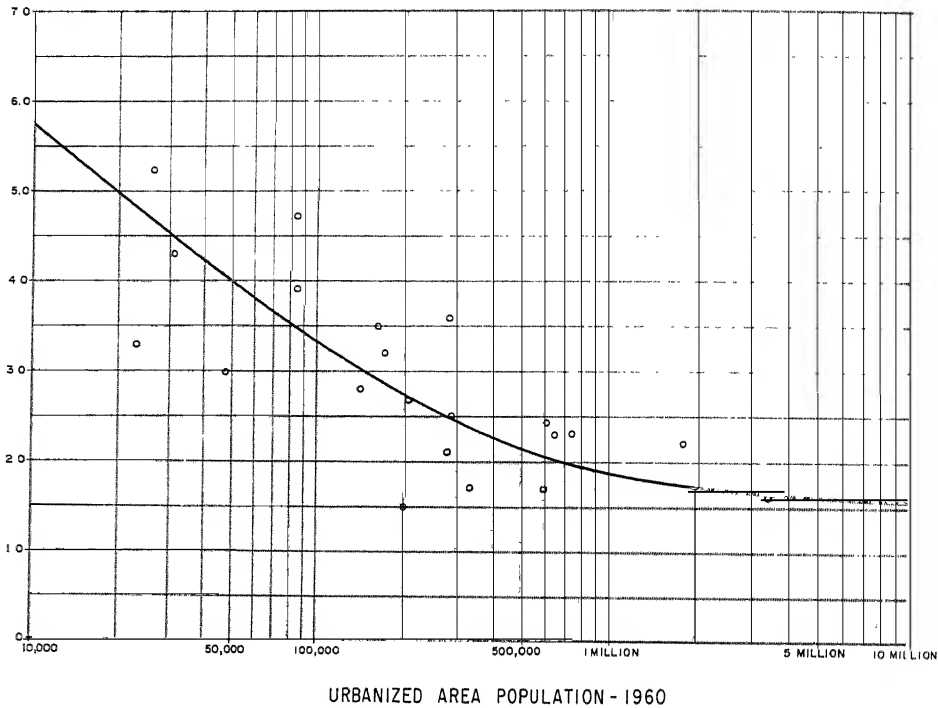


FIGURE 9

#### PARKING TURNOVER IN RELATION TO URBANIZED AREA POPULATION

The daily parking turnover (parkers per space per day) in curb and off-street facilities is shown above. For urban areas of less than 100,000 population, the average usage was about 3.0 parkers per space per day; in the large urban centers of over two million population, there were about 1.6 parkers. The higher turnover results from a decline in central business district shoppers and a corresponding increase in the proportion of workers. *Turnover can be expected to increase as new off-street facilities are designed to serve short-term parkers.*

Business trips account for one third of all downtown parkers regardless of city size. In small communities, about one third of all parkers are shoppers as compared with about one tenth in large cities. In the largest urban areas, all-day employee-parkers comprise about 40 per cent of the total and consume about 70 per cent of available "space-hours."<sup>6</sup>

Accompanying this increase in downtown work trips is a decrease in parking turnover (parkers per space per day), a lengthening of average parking duration, and a rise in average walking distances. With outlying shopping areas developing as cities expand, most convenience goods may be purchased close to home. Therefore, more downtown shoppers seek specialized commodities, make less frequent shopping trips, and stay longer.

<sup>6</sup>Each space occupied for one hour accounts for one "space-hour."

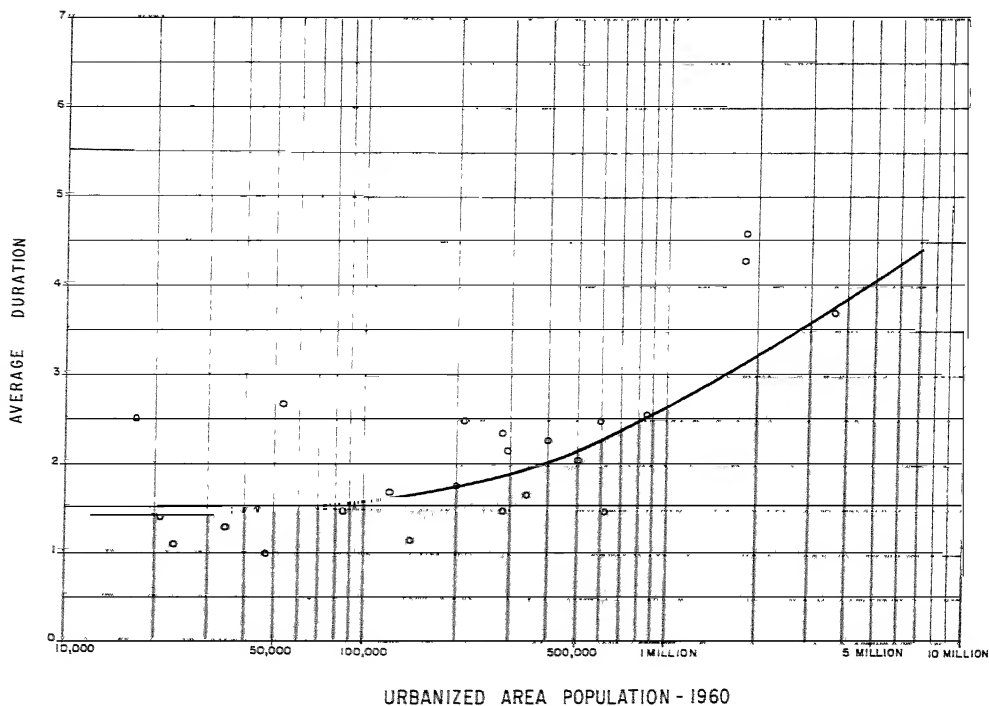


FIGURE 10

AVERAGE PARKING DURATIONS  
IN RELATION TO URBANIZED AREA POPULATION

Durations of about 1.5 hours are found in smaller cities (under 100,000), increasing to over four hours in the larger urban centers. The average duration for shopping was about one hour for urban areas in the 100,000-250,000 population group compared with about 1.8 hours for areas over one million.

**Parking Generation** — Parking demands reflect the attraction of various downtown land uses. The parking “generation” of a particular building relates to its floor area. However, such factors as availability of public transportation, variety of services afforded, clientele of stores, and location, size, and type of offices all influence demands.

Ranges in typical “parking indices” — required parking spaces per 1,000 square feet of gross floor area — are presented in Table 3 for selected downtown establishments. Banks have the highest parking demand — an average of 5.4 spaces per 1,000 square feet of area. Bus depots average 5; groceries, libraries, medical buildings, and governmental buildings 4; department stores and post offices 3; offices nearly 2; and furniture stores and hotels less than one.<sup>7</sup>

**Parking Accumulation** — The “accumulation” of parked vehicles measures the instantaneous over-all CBD parking demand for each hour of the day.

<sup>7</sup>In Philadelphia, the over-all parking demand approximated 0.3 spaces per 1,000 square feet of floor area, based on about 120 million square feet of floor area. In Dayton, it averaged 1.0, based on 10.3 million square feet of floor area.

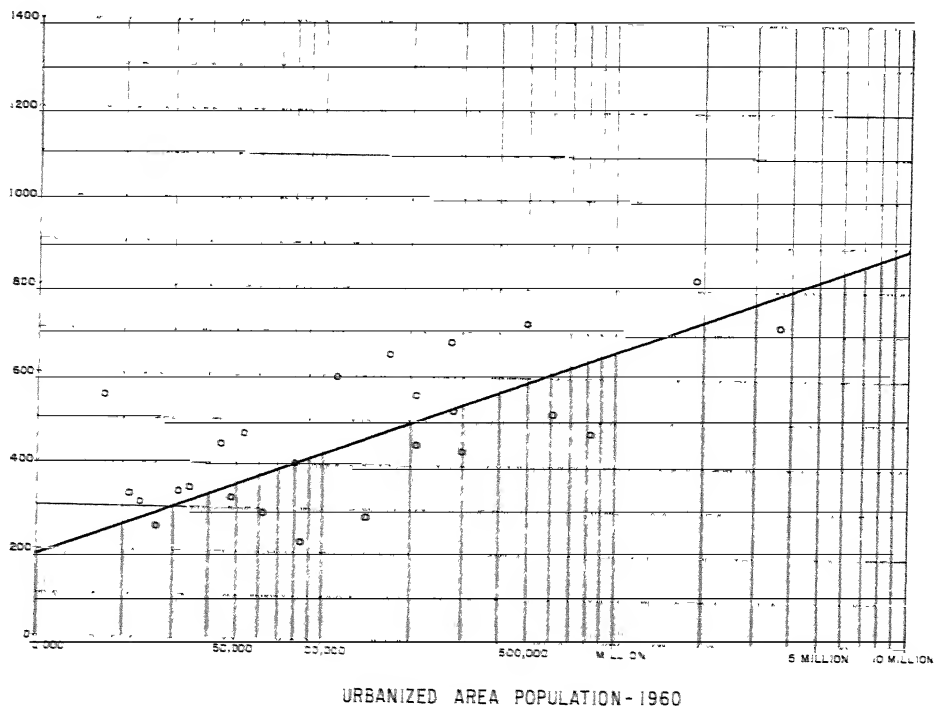


FIGURE 11  
AVERAGE WALKING DISTANCES  
IN RELATION TO URBANIZED AREA POPULATION

Average walking distances from place of parking to destination increase commensurate with urban area population. They range from about 400 feet in urban centers of 100,000 up to more than 650 feet in urban areas of a million and 800 feet in urban areas of four million. These distances show how far parkers are actually walking under existing conditions. In planning additional facilities, shorter distances should be utilized, since the majority of the parkers walk less than the average and additional space must be placed near key generators to overcome space deficiencies.

It is the number of vehicles actually parked at any given time. This accumulation generally reaches a peak between 11:00 A.M. and 2:00 P.M. About three fourths of all employee-parkers, 25 per cent of all shopper-parkers, and 20 per cent of all business-parkers are generally accumulated during this peak period.

Usually, all downtown spaces are never filled, since many remotely located garages and lots are beyond acceptable walking distances to destinations. Fluctuations in usage and delays inherent in ingress and egress also reduce the efficiency of space usage. The maximum peak-hour occupancy averages 90 to 95 per cent for core area curb spaces, and 85 to 90 per cent for lot and garage spaces.

Ratios between the maximum parking accumulation and total daily parkers in selected CBD's are given in Table 4. These ratios establish a basis for

TABLE 3

AVERAGE PARKING SPACE REQUIREMENTS FOR  
SELECTED DOWNTOWN ESTABLISHMENTS

<u>TYPE OF ESTABLISHMENT</u>	<u>SPACES PER 1,000 SQUARE FEET</u>	
	<u>Average</u>	<u>Range</u>
Banks.....	5.4	1.8-10.8
Bus Depots.....	4.8	1.7- 7.9
Libraries.....	4.1	3.9- 4.3
Medical Buildings.....	3.8	1.1- 8.6
Grocery Stores.....	3.7	1.4- 7.5
City-County Offices.....	3.6	1.2- 6.0
Post Offices.....	3.4	2.0- 4.9
Utility Company Offices.....	2.9	0.4-10.7
Drug Stores.....	2.9	1.4- 5.5
Department Stores.....	2.8	1.4- 5.1
Clothing Stores.....	2.5	1.1- 6.3
Restaurants.....	2.1	0.9- 3.3
YMCA-YWCA.....	1.6	1.2- 2.2
Offices.....	1.5	0.4- 2.9
Auto Sales.....	1.2	0.9- 1.5
Variety Stores.....	1.1	0.6- 1.9
Hotels.....	0.6	0.4- 1.0
Furniture Stores.....	0.6	0.3- 1.2

SOURCES: H. K. Evans, "Parking Study Applications," *Traffic Quarterly*, April, 1963, p. 277, The Eno Foundation for Highway Traffic Control, Saugatuck, Connecticut; parking studies in Santa Monica, Riverside, Santa Rosa, and Westwood Village, California; Las Vegas, Nevada; and Dayton, Ohio.

generalizing off-street parking demands. As the proportion of work trips rises in larger urban areas, the ratio increases correspondingly. In cities like Chattanooga, it equals about 30 per cent of the daily parkers, while in Philadelphia it exceeds 50 per cent. Values shown are slightly higher than those found by the U. S. Bureau of Public Roads in a 1956 study, perhaps reflecting the increased use of autos for work trips, particularly in medium-sized cities.<sup>8</sup>

<sup>8</sup>*Parking Guide for Cities*, U. S. Department of Commerce, Bureau of Public Roads, Washington, D. C., 1956. For urbanized areas of 250,000 population, the current ratio approximates 0.31 compared with 0.21 in 1956; for urbanized areas of one million, the current ratio approximates 0.40 compared with 0.36 in 1956.

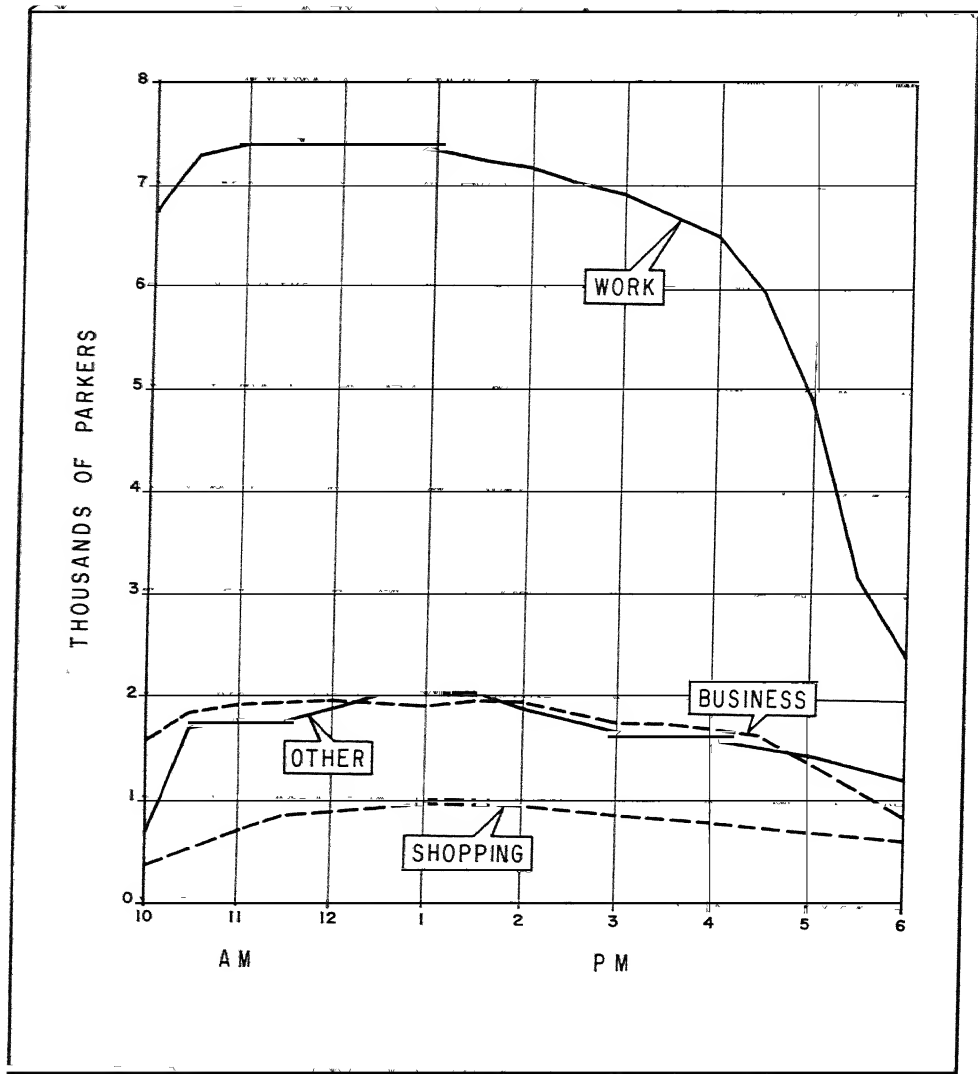


FIGURE 12

#### PARKING ACCUMULATION BY TRIP PURPOSE, NEW ORLEANS, 1960

This figure shows the accumulation of parkers, categorized by various trip purpose, in the central business district of New Orleans on a typical 1960 weekday. The maximum over-all accumulation occurred about 12:30 P.M.

As shown in Table 5, ratios for individual trip purposes are generally consistent among cities. Ratios for work trips are nearly identical, averaging slightly over 0.75 in all three cities. They are the highest of all ratios shown.

Motor trucks generally represent about 20 per cent of all vehicles entering the central business district and 10 per cent of the total CBD parkers, but represent only about three per cent of the maximum downtown parking accumulation. In consequence, the number of CBD parking spaces for trucks should approach five per cent of spaces provided for passenger vehicles.

TABLE 4

PEAK PARKING ACCUMULATION IN RELATION TO  
TOTAL DAILY PARKERS

Selected Central Business Districts

<u>URBAN AREA</u>	<u>RATIO OF PEAK (MAXIMUM) PARKING ACCUMULATION TO TOTAL DAILY PARKERS</u>
Philadelphia, Pennsylvania .....	0.54
Pittsburgh, Pennsylvania .....	0.52
Cleveland, Ohio .....	0.39
New Orleans, Louisiana .....	0.38
Dayton, Ohio .....	0.38
Columbus, Ohio .....	0.38
Nashville, Tennessee .....	0.37
Chattanooga, Tennessee .....	0.34
Columbia, South Carolina .....	0.27
Flint, Michigan .....	0.28
Lexington, Kentucky .....	0.23
Montgomery, Alabama .....	0.22
Annapolis, Maryland .....	0.19
West Warwick, Rhode Island .....	0.14

SOURCE: Comprehensive parking studies in each urban area.

TABLE 5

PEAK PARKING ACCUMULATION FOR VARIOUS TRIP PURPOSES  
IN RELATION TO TOTAL DAILY PARKERS

Selected Central Business Districts

<u>TRIP PURPOSE</u>	<u>RATIO OF PEAK (MAXIMUM) ACCUMULATION TO TOTAL DAILY PARKERS</u>		
	<u>Chattanooga</u>	<u>Nashville</u>	<u>New Orleans</u>
Shopping .....	0.22	0.26	0.29
Business .....	0.15	0.17	0.21
Work .....	0.77	0.79	0.76
Sales-Service .....	0.11	0.15	0.20
Load-Unload .....	0.07	0.09	0.17
Other .....	0.23	0.19	0.23
ALL PURPOSES .....	0.34	0.37	0.38
Time of Peak Accumulation	12:30 P. M.	11:30 A. M.	12:30 P. M.

SOURCE: Comprehensive parking studies in each urban area.

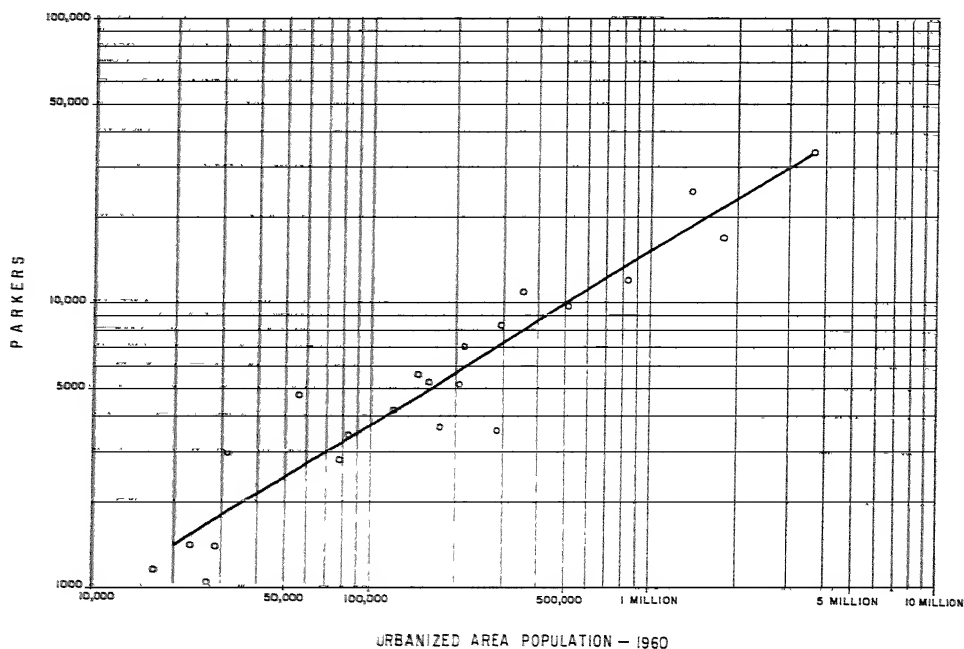


FIGURE 13  
MAXIMUM PARKING ACCUMULATION  
IN RELATION TO URBANIZED AREA POPULATION

In this scatter diagram, the points plot as a straight line on fully logarithmic paper. It is again clear that urbanized area population provides a useful measure of downtown parking activity. The maximum parking accumulation increases from about 3,800 parkers in urbanized areas of 100,000, to 15,000 in areas of about one million.

### Parking Demands and Space Needs in Typical Urban Areas

Parking space needs depend on downtown's daytime population of workers and other visitors, the proportion of CBD trips made by automobile, and the parking spaces available to meet these demands. Public parking policies, of course, also influence space requirements.

Comparisons between existing parking space supply and "realized" demand — i.e., the number of parkers with destinations in specific blocks as related to the spaces available in these blocks — show a slight over-all surplus in most urban areas when the entire central business district (including a "ring" or "fringe" of blocks surrounding the "core" of heavy demand) is considered. Core areas, varying in size but having the heaviest parking demands, however, generally have a deficiency.

*Thus, an increase in over-all parking space supply is currently required in most city centers. These spaces cannot be located at random; they must be located within acceptable walking distance of major activity centers if they are to adequately alleviate deficiencies.*



Typical parking supply-demand-need comparisons of seven selected urban areas are delineated in Table 6. Four cities reported an over-all surplus of spaces (ranging from about 750 in Charlotte to 2,000 in Nashville), while three cities reported over-all deficiencies of which the greatest, 2,300 spaces, was in Pittsburgh. Core area deficiencies ranged from 580 spaces in Charlotte to over 3,400 in Pittsburgh.

Analyses and projections of future downtown parking needs, also presented in Table 6, have been based on anticipated population and economic growth in each area, contemplated redevelopment projects, and possible further changes in downtown travel modes. Projections have generally assumed that the size and functions of the various city centers would remain relatively unchanged.

Because many future downtown travelers will come from auto-oriented suburban areas, downtown parking space demands and deficiencies will continue to rise in all cities. By 1970, over 6,000 additional spaces will be required in Philadelphia's downtown core; 2,600 spaces in New Orleans' core; and over 1,500 in the cores of cities like Charlotte, Chattanooga, and Hartford.

## **A Generalized Calibration of Downtown Parking Demands**

Urban parking habits in relation to supply-demand comparisons permit estimation of any city center's parking needs.

In general, downtown parking space demands will depend on the following factors: urbanized area population; total downtown person-trip generation, including the number of persons coming downtown for work and nonwork purposes; the proportion of total daily travel taking place between 7:00 A.M. and 7:00 P.M. (usually about 70 per cent); the "modal split" (proportion of trips by car and transit), from which the number of downtown person trips by automobile can be determined; average car occupancy (about 1.5 persons per car); the ratio between the maximum accumulation of parkers and the total parkers (about 0.25 in small cities, over 0.40 in large ones), the efficiency of parking space usage (usually about 0.85); and effects of adjustments for seasonal and locational variations.<sup>9</sup>

The general manner in which CBD parking space requirements relate to urban population is shown in Figure 14. This illustration graphically depicts the parking space factors ("P" factors) which can be applied to the proportion

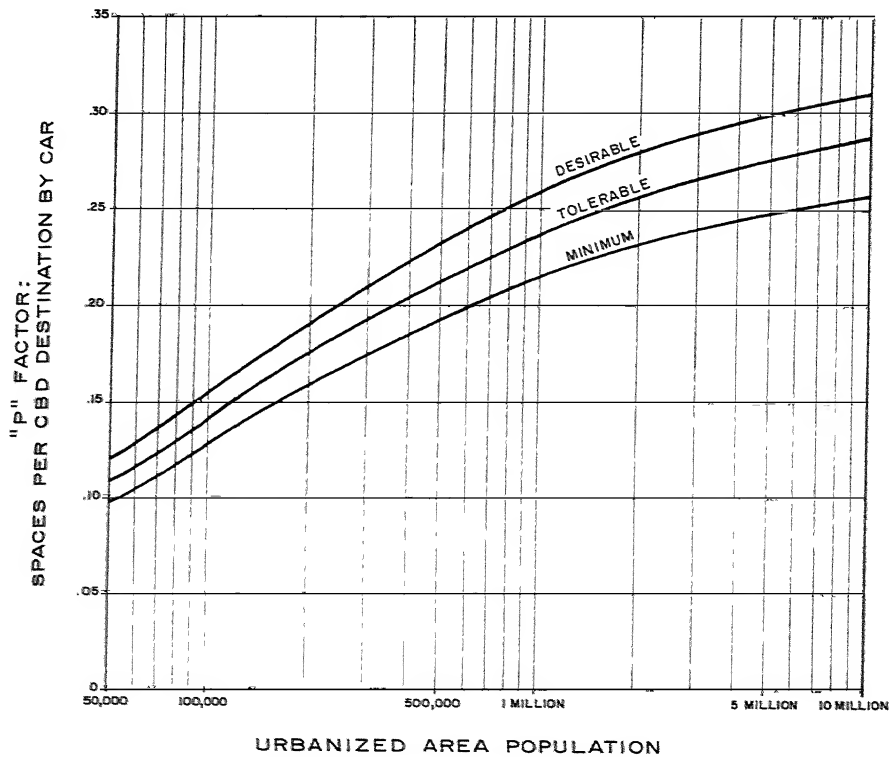
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<sup>9</sup>The ratio of maximum accumulation to total parkers varies also with trip purpose. For work trips, it averages about 0.75 (except in small cities) and 0.22 for all other trips. The over-all ratio rises as the urbanized area grows and the proportion of work trips increases.

TABLE 6  
EXISTING AND PROJECTED PARKING SPACE SURPLUSES  
AND DEFICIENCIES  
Selected Central Business Districts

URBAN AREA	TOTAL PARKING SPACES	SURPLUS (+) OR DEFICIENCY (-) IN STUDY YEAR (SPACES)		SURPLUS (+) OR DEFICIENCY (-) IN FUTURE YEAR (SPACES)	
		Study Year	CBD	Future Year	CBD
Chattanooga, Tenn.	6,908	1960	+ 1,070	1970	-2,325
Hartford, Conn.	10,423	1961	- 773	1971	-4,461
Nashville, Tenn.	15,089	1959	+ 1,990	1970	+ 252
Charlotte, N. C.	12,117	1961	+ 763	1966	- 991
Pittsburgh, Pa.	14,830	1955	-2,358	1965	-7,088
New Orleans, La.	13,634	1960	+ 771	1970	-1,573
Philadelphia, Pa.	39,024	1957	- 999	1970	-8,274

SOURCE: Comprehensive parking studies in each urban area.



#### APPLICATION OF CURVE

- 1 - ESTIMATE CBD PERSON TRIP DESTINATIONS
- 2 - ESTIMATE PERCENTAGE OF DOWNTOWN PERSON TRIPS BY CAR
- 3 - CALCULATE THE DAILY CBD PERSON TRIP DESTINATIONS BY CAR (MULTIPLY 1 BY 2)
- 4 - READ THE APPROPRIATE "P" FROM ABOVE CURVES
- 5 - CALCULATE THE CBD PARKING SPACE REQUIREMENTS (MULTIPLY 3 BY 4)
- 6 - CALCULATE ADDITIONAL PARKING SPACES REQUIRED BY COMPARING SPACE DEMANDS WITH AVAILABLE SPACES

**FIGURE 14**  
**PARKING SPACE DEMAND FACTOR**

of total downtown person-trip destinations by car.<sup>10</sup> They denote the desired parking spaces for each CBD destination by auto. Once the total downtown attraction and modal split are determined, these curves may be used to provide a first approximation of either present or future parking requirements.

Curves are shown for "desirable," "tolerable," and "minimum" demand levels. The desirable demand reflects *both* core needs and seasonal fluctuations. The tolerable demand level provides sufficient space for the typical weekday, giving consideration to concentrations of demand in the core area. (It recognizes that certain spaces are beyond acceptable walking distance.) The minimum demand level deletes the concentration factor.

For example, when the urbanized population is 100,000, the desirable, tolerable, and minimum "P" factors are 0.158, 0.144, and 0.131, respectively. For an urban population of one million, the three factors are 0.262, 0.238, and 0.217.

When purposes of downtown-destined auto driver and passenger trips are known, parking space demands can be calculated directly from a series of adjusted factors. Desirable, tolerable, and minimum parking spaces for each CBD work trip by auto are 0.500, 0.454, and 0.412, respectively. Corresponding values for CBD nonwork trips by auto are 0.147, 0.133, and 0.121.<sup>11</sup>

These various factors provide generalized estimates of downtown's overall parking space demands. By relating derived demands to the existing or projected supply, the approximate number of additional parking spaces required can be calculated.

The estimation of future needs obviously requires careful and detailed investigations, since downtown land-use intensity and generation might vary beyond increases achieved from normal population growth alone. Major changes in downtown's function, such as might be brought about by extensive redevelopment, could greatly alter demands. *Also, feedback between modal split and parking space supply should be taken into account in appraising the parking needs of any specific city center.*

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<sup>10</sup>The curves are based on the following formula:

$$P = \frac{d r s c}{o e} = \frac{(0.70) r s c}{(1.5) (0.85)} = (0.55) r s c$$

P = parking space factor ("P" factor)

d = daytime CBD travel factor = 0.70

o = occupancy — persons per vehicle = 1.5

e = efficiency of space use = 0.85

r = ratio of peak to total daytime parkers

s = seasonal peaking factor

c = locational adjustment factor to reflect concentration of demands in core area.

The "desirable" parking supply curve assumes s and c each equal to 1.1; the "tolerable" curve assumes s equal to 1.0 and c equal to 1.1; the "minimum" curve assumes both s and c equal to 1.0. To obtain the actual number of spaces, the parking space factor is multiplied by the total downtown destinations and the per cent coming by car.

<sup>11</sup>For example, if there were 50,000 CBD work trips and 70,000 other CBD trips by auto with destinations downtown, it would be desirable to provide 25,000 parking spaces for workers, and 10,300 for other parking purposes.

### III. DOWNTOWN PARKING ECONOMICS

Off-street parking provides important economic services to the city center. It benefits travelers by enabling them to reach their downtown destinations easily. Driver acceptance of parking costs clearly reflects such tangible benefits as time and convenience.<sup>12</sup>

Adequate off-street parking helps attain effective central area traffic circulation, since it is pre-requisite to the implementation of needed CBD traffic control and operational improvements. In contrast, inadequate parking precipitates illegal use of curbs which adversely affects the entire central area circulation. *Even in transit-oriented areas like Manhattan, strategic locations of downtown parking terminals are essential for intelligent and effective application of curb parking regulations.* It is not practical to remove much downtown curb parking unless adequate off-street parking is available.

Parking enhances downtown's economy by placing it in a more favorable competitive position with outlying centers in terms of both customer attraction and new investments. Attractive parking, therefore, has become essential for modernization of the city center. Development of plazas, pedestrian malls, new commercial and retail buildings, and high-rise apartments in place of dilapidated structures usually requires adequate parking facilities to accommodate occupants and visitors.

In addition to parking's contributions to both urban travelers and downtown land uses, it is often a flourishing business in itself. This, too, must be considered in evaluating its role in the modern city center.

#### **Parking Benefits to CBD Land**

A variety of activities compete for the use of downtown land according to the returns they expect, and the rents they can afford to pay. In most central business districts, therefore, peak land values are found in areas of high-use intensity. In the past, parking facilities were usually located adjacent to, rather than within, these high-intensity cores. However, a significant new trend is the development of parking facilities *within* new buildings, often erected on or near peak-value locations.

The patterns of parking facility location are similar from city to city. As shown in Figures 15 and 16, parking has *not* extensively developed along downtown's "main streets." Garages are carefully placed with respect to major

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<sup>12</sup>It should not be construed that downtown parking demands are wholly independent of parking charges. However, motorists value time and, within limits, appear willing to pay for time savings provided by convenient parking locations.

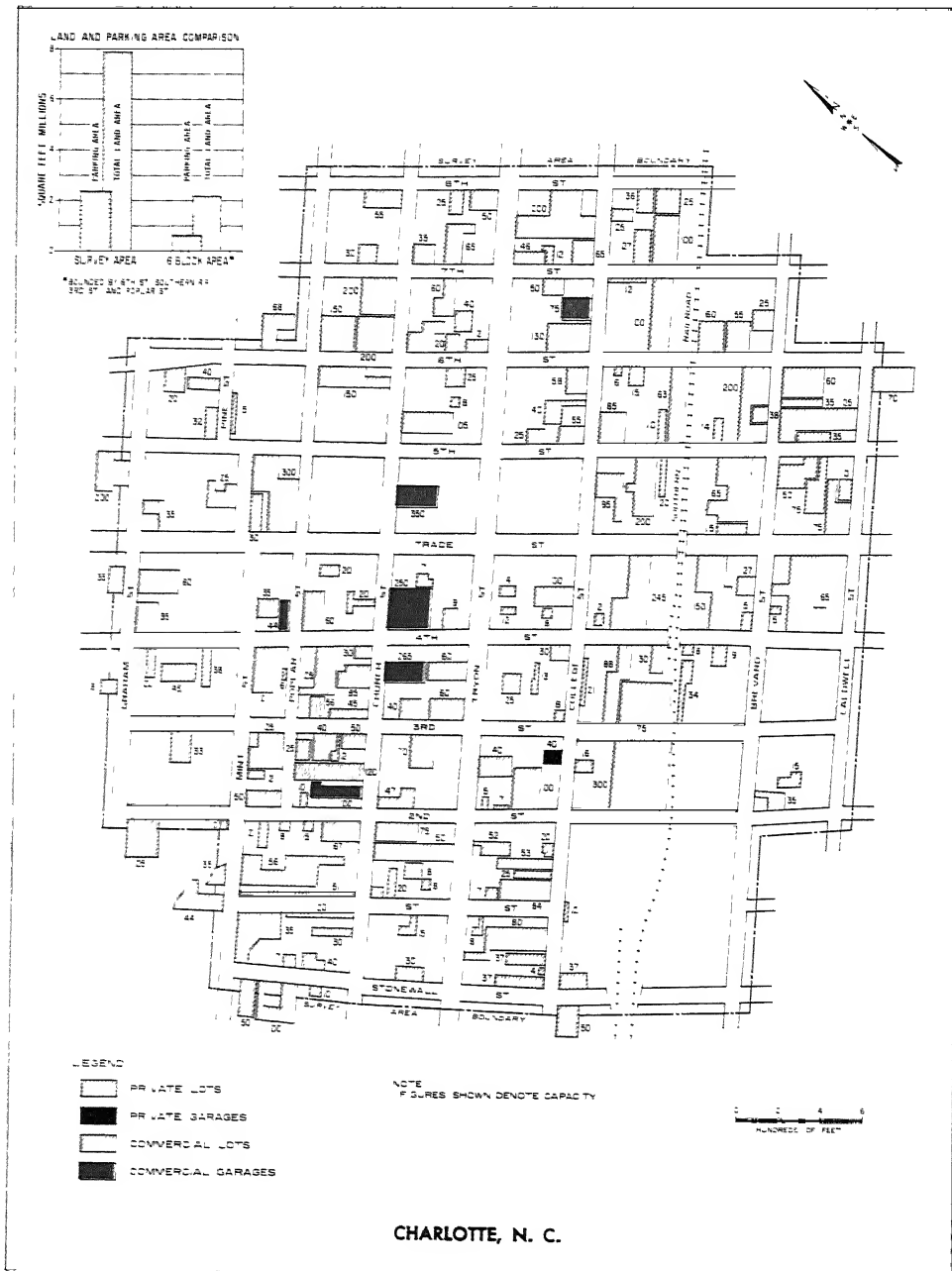


FIGURE 15  
TYPICAL DOWNTOWN PARKING FACILITY PATTERNS

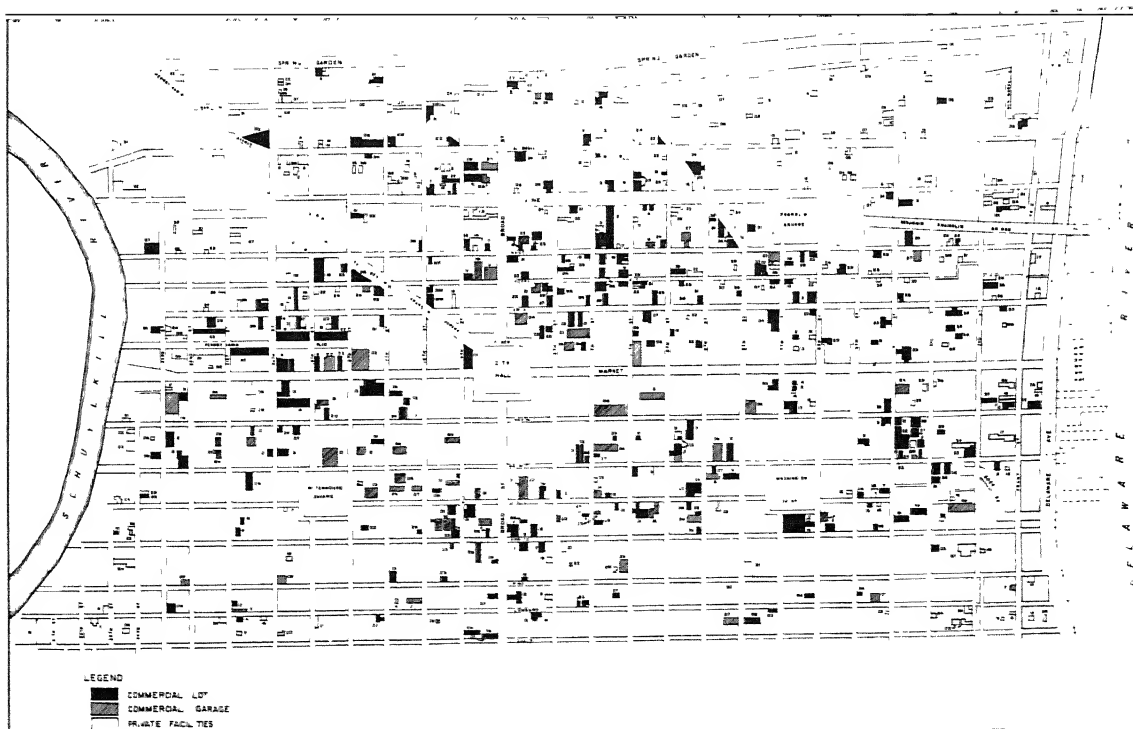


FIGURE 16  
PHILADELPHIA'S PARKING FACILITY PATTERNS

building complexes, generally to obtain the highest returns on parking investments. The prevalence of parking lots, often on the fringes, usually results from interim land-use developments, or from difficulties encountered (because of multiple land ownership) in obtaining land parcels of desirable shape and size.

Thus, use of downtown land for parking results from the interplay of natural market forces. Downtown off-street parking has become, in many respects, another commodity (or service) competing in the market place and subject to all the interacting factors of its environment. In many ways, parking is analogous to the speciality shop: each depends upon and augments the major generators of downtown trips.

**Parking Stimulates Downtown Investment** — Downtown parking does not pre-empt prime land from major alternate uses. On the contrary, it is frequently the highest and best use for a particular location. Parking is also an important complementary land use which reinforces the vitality of other major activities; often it serves as a catalyst or incentive to downtown investment decisions. As such, it provides an important economic service; for without adequate parking many downtown investments would be unfeasible. Pershing Square, Los Angeles, with its underground garage, has become the locus of new office development. And in San Francisco, property adjacent to the Union Square Garage has shown a sharp rise in value.<sup>13</sup>

<sup>13</sup>"Part 5 — Trends in Economic Activity and Transportation in San Francisco Bay Area," *Parking as a Factor in Business, Special Report 11*, Highway Research Board, National Academy of Sciences, Washington, D. C., 1953, p. 292.

Current renewal efforts clearly reflect the rising need to conserve and revitalize the nation's central business districts. Often, they achieve a considerable increase in city tax revenue (although revenues may be low during construction).<sup>14</sup> Although the economic climate for renewing urban centers varies among cities, urban renewal usually affords opportunities for a *total* downtown design encompassing buildings, open spaces, transit, freeways, streets, and parking.<sup>15</sup> Parking is a vital part of these downtown renewal plans and often prompts investment by private enterprise.

Examples of parking in urban redevelopment are becoming increasingly common. With its 1,800-car garage, Hartford's Constitution Plaza is stimulating other downtown modernization. In Rochester, New York, the Midtown Plaza incorporates an 1,800-space underground garage. Parking is an integral part of Bunker Hill, Los Angeles; Gateway Center, Pittsburgh; and Charles Center, Baltimore; and at Penn Center, Philadelphia, a major garage has been constructed near the hotel and office building complex.

Department stores often locate in downtown renewal projects. Macy's, for example, is penetrating a new market in New Haven; here, the amount of parking was stipulated *before* the decision to locate was reached. Location in New Haven's Church Street Redevelopment Project was largely contingent on proximity of the Oak Street Expressway connection, a 1,500-space Temple Street garage, and other nearby parking. Without parking, it is unlikely — all other factors being constant — that the store would have located there.

Downtown parking, in turn, benefits from the various urban renewal efforts undertaken through both private and public initiative. Cities, for example, can receive financial credit for parking garages. Renewal facilitates assembly of large land parcels and overcomes land acquisition problems inherent in multiple land ownership. Moreover, the integration of parking with other land use permits sharing of land costs and builds markets for parking facilities. In the long run, renewal promises to lead to increased business activities in the hearts of cities.

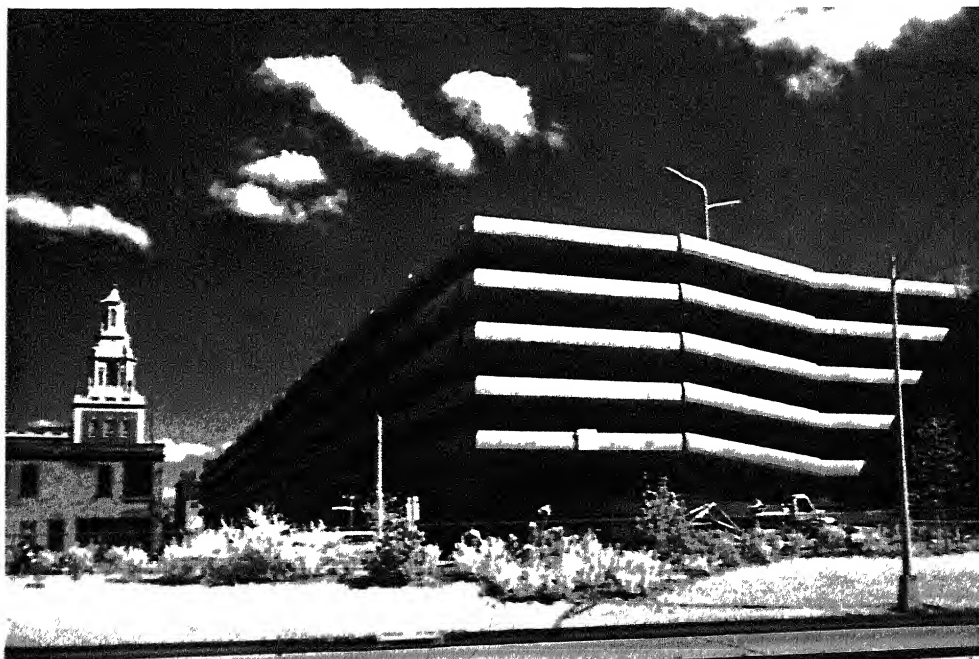
**Direct Values of Off-Street Parking** — Measurable parking benefits are widespread; each day the number of examples increases. Parking has become a major factor in the success of many downtown enterprises. Its impact on retail sales is especially noteworthy, even in transit-oriented city centers.

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<sup>14</sup>For example, more than 50 per cent of the 400 acres in downtown Detroit not used for streets, alleys, or parks are currently rated as blighted; within Chattanooga, 75 per cent of the downtown stores are considered blighted to some degree.

<sup>15</sup>H. Hoyt, "Economic Climate for Future Urban Development," *Proceedings, Conference on Metropolitan Transportation and Urban Renewal*, University of Southern California, November 16-17, 1962. Land uses in renewal projects should relate to the economic returns they provide. Generally, economic justification of downtown redevelopment lies in the primary city center functions — such as regional offices, government and cultural centers, and major retail shops. In proper proportions, parking should also be included. By eliminating marginal, sometimes fragmented, land uses (as on the fringes of downtown), urban renewal can serve to increase both the efficiency of the over-all transport system and the image of the city center.





TEMPLE STREET GARAGE  
NEW HAVEN, CONNECTICUT

Approximately 70 per cent of Manhattan's auto shoppers, for example, indicated that the availability of convenient parking spaces would encourage additional shopping. More evening shopping hours, more self-service, and less traffic congestion were listed by the remaining 30 per cent as factors that would increase downtown shopping.<sup>16</sup>

In cities such as Chattanooga and Knoxville, the majority of downtown shoppers arrive by car (Table 7). These typical auto-shoppers generally make higher average purchases than shoppers using transit, for they generally have higher incomes. In Chattanooga and Knoxville one third of all auto drivers made purchases over \$10 per day, as compared with about one fourth of all transit passengers. Approximately two thirds of all purchases over \$10 were made by auto drivers and passengers.

*The higher average purchases by motorists explain why downtown department stores increasingly provide convenient off-street parking for patrons, thereby capitalizing on the large selection of goods at their historic locations. Many parking facilities have been developed by, in conjunction with, or adjacent to department stores (Table 8). Even in cities with rapid transit, such as Philadelphia, the number of downtown department stores providing parking is continuing to rise.*

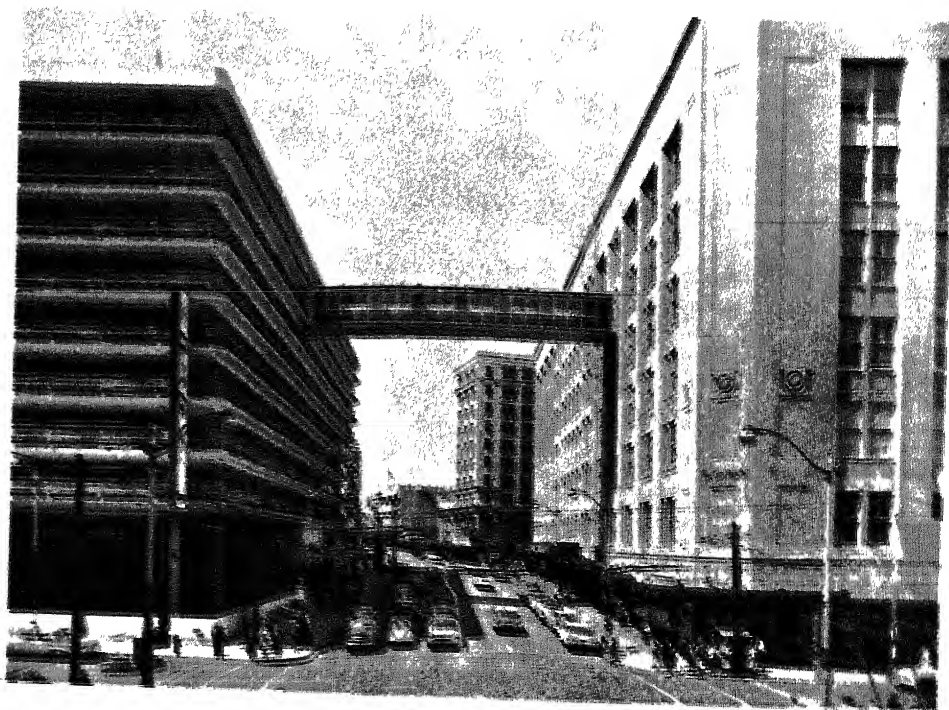
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<sup>16</sup>L. A. Dondanville, "Central Business District Parking," presented at the 1961 Annual Convention, American Society of Civil Engineers, New York City, October 19, 1961.

TABLE 7  
COMPARISON OF DOWNTOWN SHOPPER TRAVEL MODES  
IN SELECTED CITIES

MODE OF TRAVEL	PER CENT OF TOTAL SHOPPING TRIPS			
	<u>Chattanooga</u>	<u>Knoxville</u>	<u>Akron</u>	<u>Providence</u>
Auto Drivers and Passengers.....	63.0	58.9	54.0	43.0
Transit.....	29.4	35.4	41.0	52.0
Walk.....	5.7	4.5	4.0	5.0
Taxi.....	<u>1.9</u>	<u>1.2</u>	<u>1.0</u>	<u>0.0</u>
Total.....	100.0	100.0	100.0	100.0

SOURCES: *Greater Akron Transportation and Traffic Survey*, Simpson and Curtin, 1956; *Trade, Transit, and Traffic, Providence, Rhode Island*, Wilbur Smith and Associates, 1958; *Transportation Program — Traffic, Transit, and Parking, Chattanooga, Tennessee*, Wilbur Smith and Associates, 1961; *Mass Transportation in the Knoxville Metropolitan Area*, Wilbur Smith and Associates, 1965.



BON MARCHE, SEATTLE, WASHINGTON

TABLE 8

TYPICAL DOWNTOWN DEPARTMENT STORES WITH ADJACENT  
OFF-STREET PARKING FACILITIES

<u>CITY</u>	<u>STORE</u>	<u>APPROXIMATE SPACES</u>
Atlanta	Rich's.....	970
Baltimore (Towson)	Hutzler.....	1,100
Beverly Hills	Robinson.....	900
Cincinnati	Shillito.....	900
Cleveland	May Company.....	720
Columbus	Lazarus (four garages).....	2,000
Denver	May Company.....	1,800
Hartford	G. Fox.....	850
Hartford	E. J. Korvette.....	200
Houston	Foley.....	800
Kansas City	Sears.....	900
Knoxville	Miller.....	350
New Haven	Malley-Macy.....	1,500
Philadelphia	Lit Brothers-Strawbridge & Clothier.....	1,000
Pittsburgh	Joseph Horne.....	600
Pittsburgh	Kaufman.....	1,400
Richmond	Thalhimer-Miller and Rhodes.....	700 <sup>1</sup>
Salt Lake City	CZMI.....	550
Seattle	Bon-Marche.....	1,300
Shreveport	Selber.....	400
St. Louis	Famous-Barr.....	800
St. Paul	Dayton.....	700
White Plains	Macy.....	1,200

<sup>1</sup>An additional 700 spaces will be completed in 1965.

SOURCE: Compiled by Wilbur Smith and Associates.

Many department stores indicate that convenient downtown parking increases their sales. They frequently estimate the value of a parking space as the generator of up to \$10,000 in annual retail sales, dependent, of course, on other values such as market demand.<sup>17</sup> In this manner, parking helps place

<sup>17</sup>Annual downtown sales can be related to the various modes of transportation, thereby determining the contribution of each. Thus, each transit vehicle, each automobile parked, or each parking space has a "dollar value" equivalent in annual sales.

central business district retail establishments on a more favorable competitive basis with outlying commercial centers. Thus, if downtown interests neglect parking, they place downtown stores at a competitive disadvantage.

**Land Use and Parking** — Many discussions have centered on the limited availability of downtown land and the need to put it to its best economic use, implying that parking is not such a use. This contention does not appear valid in most city centers, especially where vacant buildings permeate the CBD. It seems doubtful, too, that parking is a less valuable land use than such marginal occupants as magazine shops, shoe-shine stands, pawnshops, and used furniture stores.

Even where land values are high, parking may be essential to assure they remain that way. The downtown department store which constructs a large, adjacent parking garage is *not* pre-empting valuable real estate for an unproductive purpose, but is providing convenient parking in an attempt to assure steady patronage. This is especially true wherever modern multideck garages are constructed as integral parts of downtown developments.

### **Meeting Downtown Parking Needs**

Cities recognize the many values of off-street parking. Almost every urban area has exercised initiative in expanding its downtown parking within recent years. Both public and private enterprise have developed many off-street facilities, especially multideck garages. Yet despite rapid gains in parking, space deficiencies still exist, particularly in core areas. Consequently, many cities plan to further expand their parking supply within the next 10 to 15 years to serve desired or anticipated increases in downtown activity.<sup>18</sup>

Adjacent land uses also attribute significant values to parking. As previously indicated, department stores frequently provide off-street parking, both downtown and in outlying areas. Joint development of office buildings and parking is common, especially in newer auto-oriented central business districts where it is widely accepted that new building complexes must provide or include adequate, convenient parking to ensure success. And rapid transit proposals, as in San Francisco, do not apparently affect the growing market for off-street parking.

Major cities in Europe, too, are constructing off-street parking garages. The new 1,100-car Park Lane garage in London is located under Hyde Park, and additional garages are contemplated under Crown land in central London. Hamburg, Germany, plans to expand present garage capacity from 2,200 to nearly 10,000, and total downtown spaces from 14,000 to 25,000.<sup>19</sup>

Because of downtown parking's importance, direct and indirect aids have

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<sup>18</sup>Case studies of parking developments, trends in facility type, and suggested design standards are set forth in Chapter IV.

<sup>19</sup>Source: J. Brierly, *Parking of Motor Vehicles*, C. R. Books, Limited, Lennox House, London, 1962.

resulted from assessment policies, municipal participation, development of facilities by department stores, urban renewal, and/or joint use of office buildings. These aids are generally rationalized by the benefits they confer. Moreover, they are consistent with general practices used to attract customers or investments, such as the aesthetics and prestige aspects of an office building; the "loss leaders" in a department store; and actions by municipal officials to attract new industry.

**Public and Private Developments** — Private enterprise has continually developed off-street facilities even where municipal parking dominates. But such developments are often complicated by site acquisition problems resulting from absentee and/or multiple land ownership, and unwillingness of key property owners to sell. Cities, on the other hand, have been more readily able to acquire needed land parcels to develop suitable parking sites near primary building clusters. (Sometimes, however, municipal parking programs are more costly than private.)

The urban area, age, economy, and downtown intensity have often influenced the methods by which downtown parking is provided. In large, old transit-oriented cities such as Chicago, garage development often has been undertaken by municipal agencies because of high land costs and land assembly problems. Also, heavy transit orientation of downtown travelers may limit the potential parking market, especially where rapid downtown expansion has not occurred.

In cities where many downtown travelers arrive by automobile, combinations of public and private approaches have met with success. Cooperative actions have proven successful in Pittsburgh, Buffalo, Detroit, San Francisco, and Los Angeles.

Where downtown land costs are comparatively low and/or central areas are increasing in size or intensity, private interests provide most parking. This is the case in downtown Houston, Atlanta, Washington, and Dallas, which are expanding to assume regional office functions. Private parking developments also have been remarkably successful in downtown Minneapolis.

**Changes in Facility Development** — Additional downtown parking spaces have been developed primarily in multideck garages within recent years. As shown in Table 9, this pattern is similar among cities of various population classes.

Hartford, for example, has added over 3,000 spaces in the last decade; garage spaces have been doubled in contrast to a 10 per cent gain in lot spaces and a slight decline in curb spaces. Within generally comparable time periods, Pittsburgh developed eight major garages containing 6,000 spaces; Los Angeles added 4,200 garage spaces and 3,000 lot spaces; and San Francisco added nearly 5,000 garage spaces.

**Economic Equilibrium in Off-Street Parking** — Trends denote a further blending of parking into the downtown setting. They suggest that natural market forces, stimulated by renewal and downtown parking garage develop-

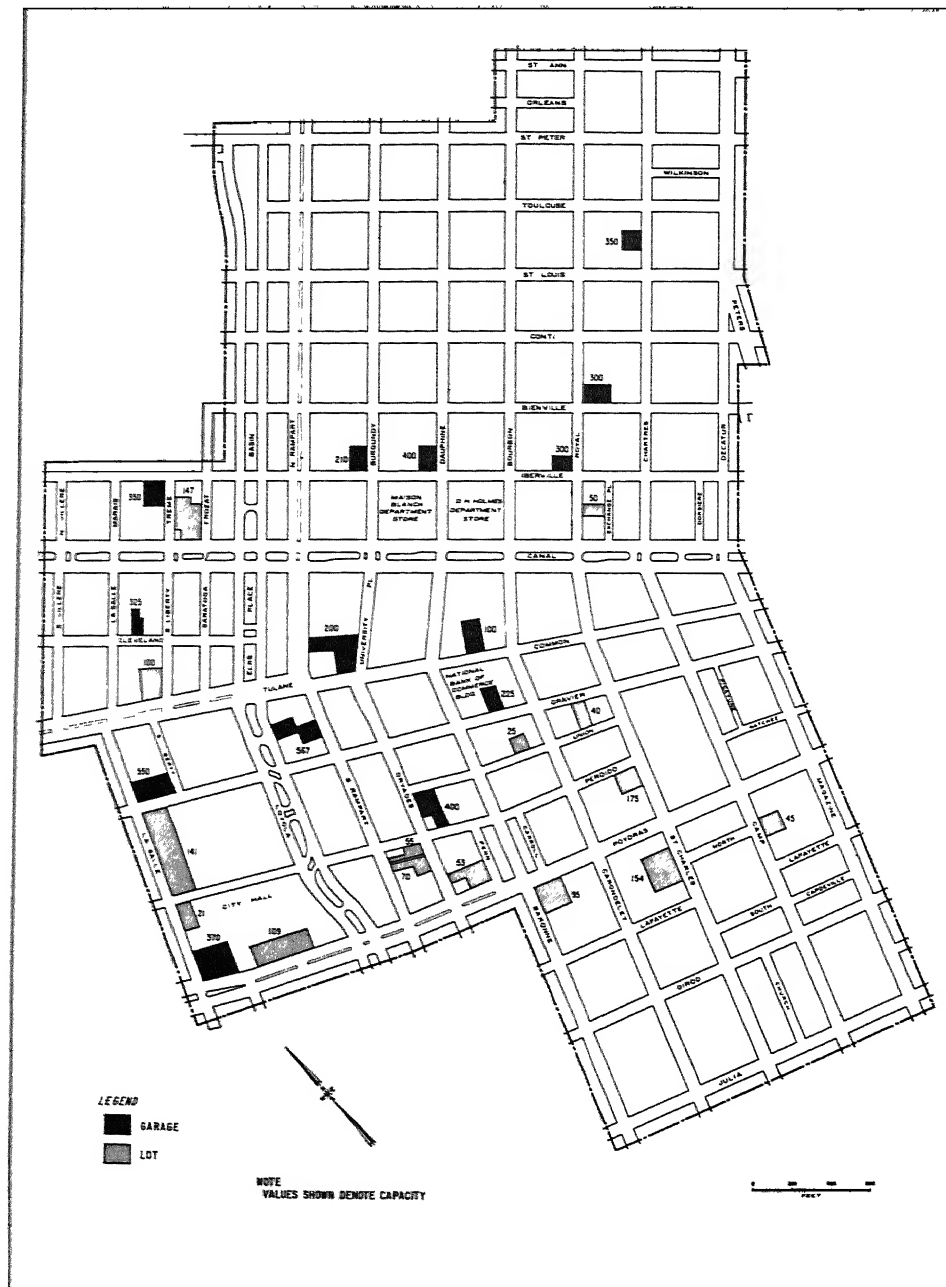


FIGURE 17

# OFF-STREET PARKING DEVELOPMENT — NEW ORLEANS

Development of core area garages paralleling Canal Street has progressed rapidly during the last eight years. While lot development has continued at the periphery of the business district, 15 lots and 14 garages have been developed. Most facilities afford attendant parking. Except for the Civic Center and the Tulane Medical School garages, all parking has been provided by private enterprise. Although two garages have been built by hotels, most construction has been on an investment basis.

TABLE 9  
RECENT CHANGES IN OFF-STREET PARKING SPACES  
Selected Central Business Districts

<u>CITY</u>	<u>YEARS INCLUDED</u>	<u>APPROXIMATE SPACE ADDED</u>		
		<u>Lot</u>	<u>Garage</u>	<u>Total</u>
Baltimore.....	1947-1963	N.A.	N.A.	7,000 <sup>1</sup>
Hartford.....	1955-1963	620	3,200	3,820
Houston.....	1953-1961	4,980	4,920	9,900
Los Angeles.....	1956-1961	2,940	4,210	7,150
Pittsburgh.....	1955-1963	1,030	6,000	7,030
San Francisco.....	1955-1962	N.A.	4,860	N.A.
Washington, D. C. ....	1955-1962	N.A.	5,000	N.A.

<sup>1</sup>Added by Parking Authority.

N.A. — Not Available.

SOURCE: Compiled from data received from each urban area.

ment, will strive toward an equilibrium between the supply and demand of downtown off-street parking space. Thus, as new facilities are added, most urban areas can increasingly meet their parking needs without changing the basic character of their downtown center.

The manner in which this parking supply-demand equilibrium can be attained is shown in Figure 18. It can be briefly summarized as follows:

The gradual intensification of downtown's core will tend to increase downtown land values.

The economics of parking facility development point toward increasing construction of garages as land values rise. Since core garages have a higher unit cost per space, the average cost of downtown parking can be expected to increase (except perhaps where structures are combined with other building operations).

Parking fees usually relate to costs of facilities. Parking demands, based on demand-cost relationships, tend to decrease as parking costs increase (holding other variables constant).

Thus, increased average parking costs will approach equilibrium at that

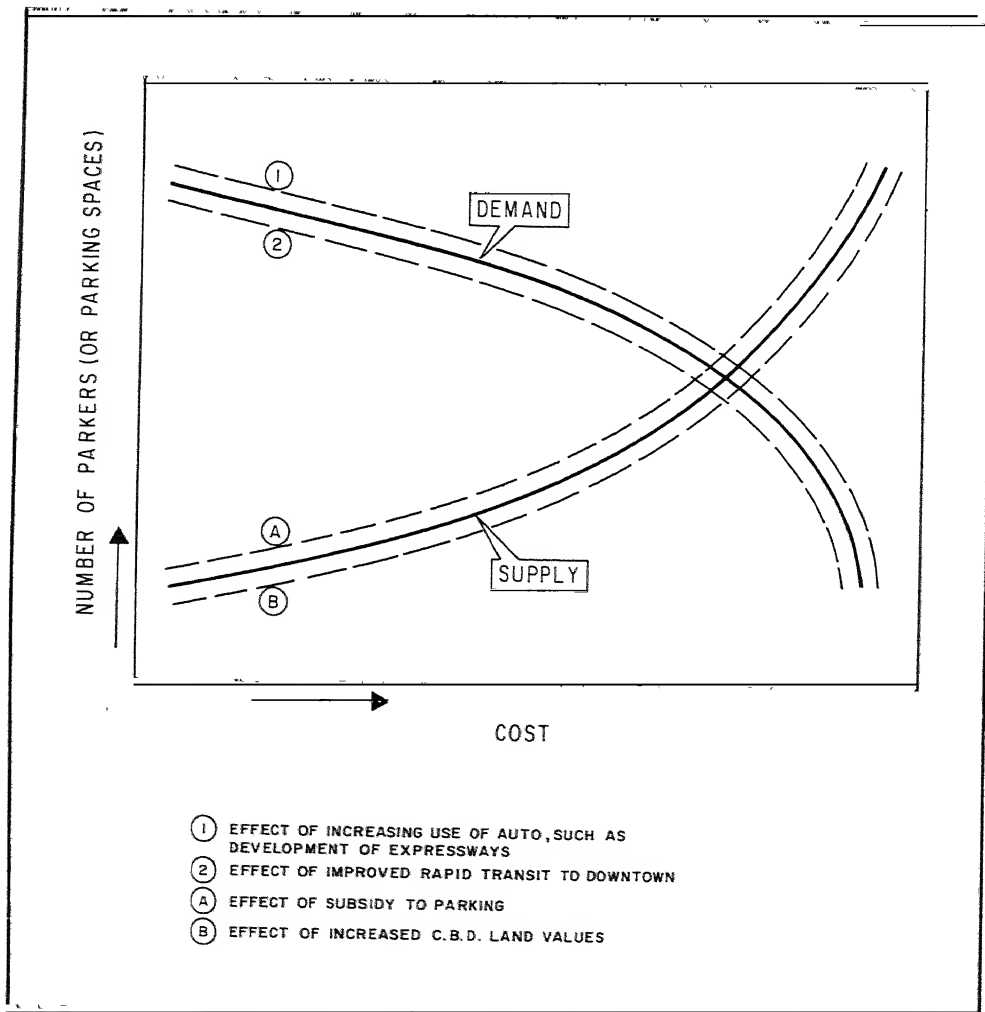


FIGURE 18  
ECONOMIC EQUILIBRIUM OF  
OFF-STREET PARKING (HYPOTHETICAL)

point where supply and demand curves intersect. This equilibrium has probably not been reached in most cities.

Where parking facilities are supported by municipal governments or special interests (as department stores), fees will decline, with a consequent increase in demand. The short-term effects will be to increase demands in an attempt to increase downtown intensity; but, as more people come downtown and the value of downtown land increases, over-all parking costs can be expected to increase. This will result in a stabilization and possible relative reduction in demands. The long-term result would again approach an equilibrium point.



Highway access improvements and greater automobile ownership will probably tend to increase parking demand curves for every given cost level, while improvements in transit could serve to decrease demands at each cost level. In each case, an equilibrium point would be achieved.

Within the central business districts of mature cities, such as Baltimore, approximately eight per cent of all downtown floor space (including ground area but excluding streets) is devoted to off-street parking. In automobile-oriented downtown areas, such as Los Angeles, this figure may increase to about 15 per cent. But even here, the vast bulk of CBD floor space is devoted to *other* uses. It is unlikely, therefore, that *properly planned* parking facilities will unduly fragment downtown.

### **Costs and Revenues of Downtown Parking Developments**

Costs, location, usage, and income of parking facilities are sensitive to land values and space demands. Economic feasibility depends on the manner that land, development, and operating costs relate to revenues obtained, and financing methods employed.

**Effect of Land Costs** — Land costs for parking largely reflect competitive uses of surrounding properties. Where land is abundant and comparatively inexpensive, multilevel parking structures are seldom justified. In these cases, parking lots are usually developed since they cost the least. Land for lots is usually leased, with annual rentals of \$60 to \$75 per car space common.

In the cores of the nation's larger cities, there are often many competing demands for space. Here, land costs (either by purchase or lease), coupled with large and localized parking demands, usually dictate construction of garages at centrally located sites. Site costs alone may range from \$1,500 to \$3,000 per space. To these must be added construction costs — from \$1,500 to \$1,800 per space for conventional ramp structures and from \$2,000 to \$3,000 for most mechanical garages. Underground garages usually cost \$4,000 or more per space.

Because high daily incomes per space are required to amortize costs, garages are frequently located and designed to achieve rapid parking turnover. A parking fee of 25 cents per hour in a high-turnover location may produce revenues equal to a \$25 to \$50 monthly parking fee.

The effects of land and construction costs on the unit costs for lot, deck, multideck, and underground parking facilities are apparent from Figure 19. This figure clearly denotes the economic range for each type of facility in relation to land costs.<sup>20</sup>

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<sup>20</sup>The following assumptions were used in deriving cost calculations: approximately 350 square feet per parking stall; parking lot construction costs of \$1.50 per square foot for demolition, grading, paving, lighting, fencing, landscaping, traffic appurtenances, and necessary operating equipment including ticket dispensers, cashier's booths, and cash register; total construction and development costs of \$1,400 per space for simple deck construction, and \$1,600 per space for parking garage construction; eight per cent was added to both land and construction costs for miscellaneous items, including financing charges.

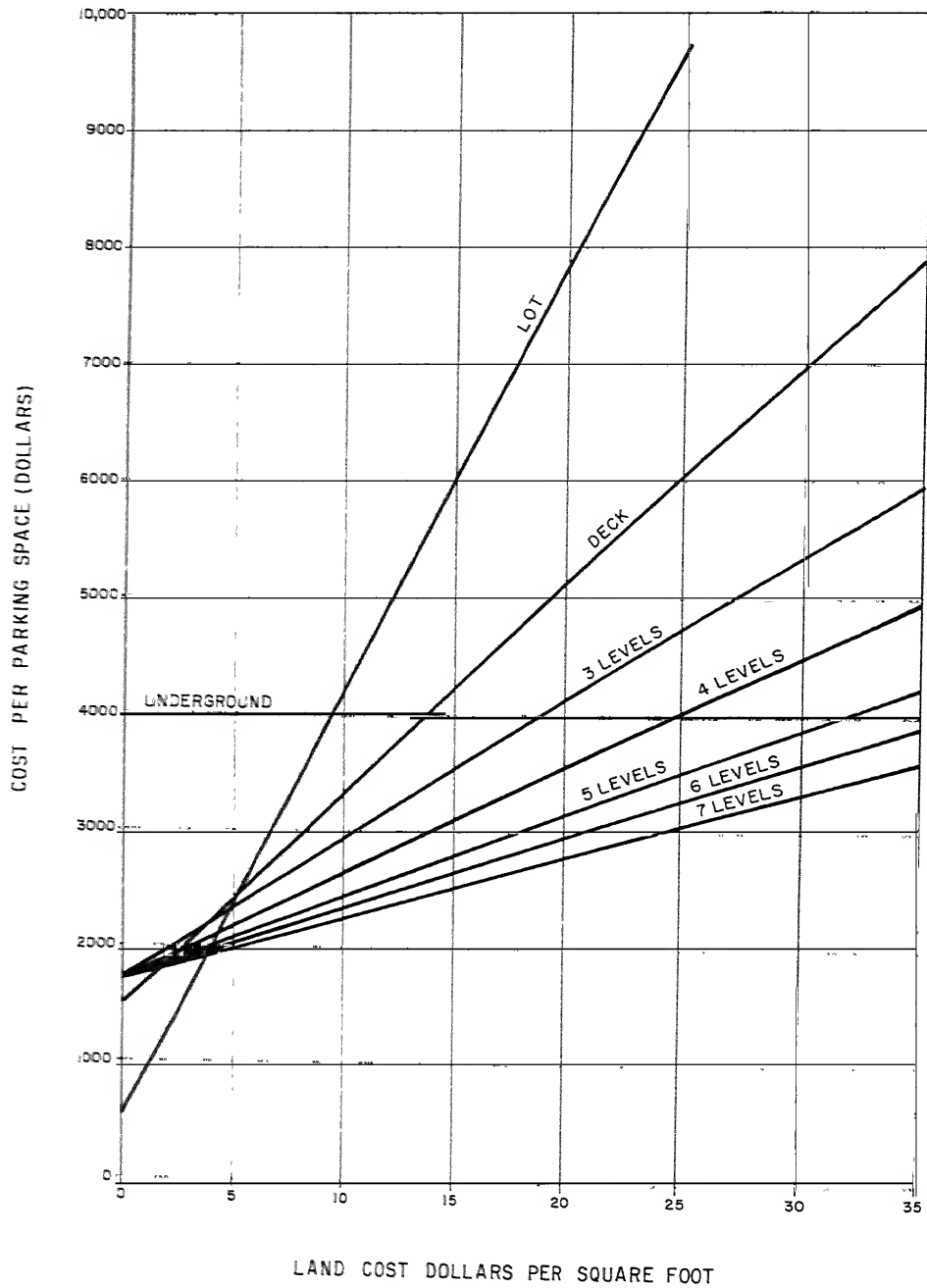


FIGURE 19  
PARKING SPACE COSTS  
IN RELATION TO LAND VALUES

For land values below \$5 per square foot, parking lots are generally more economical per space than garages. Between \$5 and \$24, multideck garages cost less per space than open lots. For unusually high land costs, combination facilities with vertically-mixed land uses may be feasible.

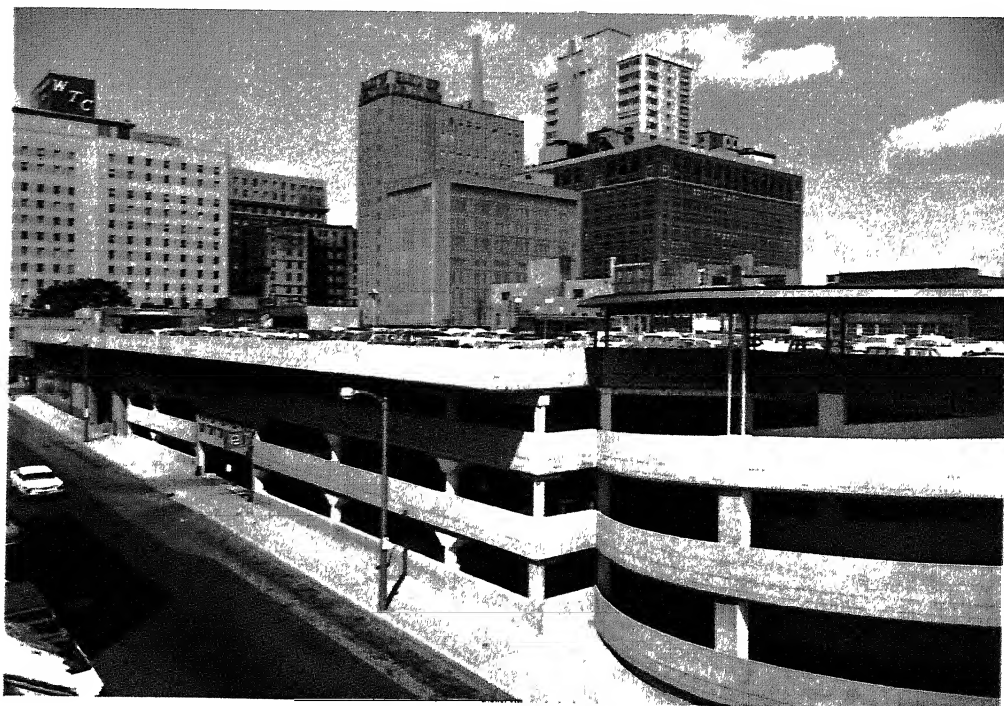
High land costs for parking facilities may be reduced by reserving ground floors for retail use, and applying rents received to the total land costs. In Pittsburgh, for example, the Parking Authority received \$30,000 in annual rent from ground-floor retail tenants — a six per cent return on land costs.<sup>21</sup> Elsewhere, even more profitable returns have been reported.

Wilmington's Midtown Parking Center clearly illustrates the economic advantages of such combined retail and parking facilities. The facility provides 28,000 square feet of ground-floor retail area in conjunction with a 482-space parking garage. As shown in Table 10, the retail shops account for nearly one third of the annual \$165,800 net income. After debt service payments, they account for nearly half of the \$52,000 annual reserve. Thus, the retail areas clearly enhance the feasibility of the entire project.

*Combined facilities* (in which retail shops are placed on the ground floor) are also desirable from a standpoint of downtown land use. Even in highly-

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<sup>21</sup>"Urban Traffic Forum," *Architectural Forum*, February, 1953.



MIDTOWN PARKING CENTER  
WILMINGTON, DELAWARE

TABLE 10  
CONTRIBUTION OF RETAIL STORES TO ANNUAL INCOME  
MIDTOWN PARKING CENTER – WILMINGTON, DELAWARE

<u>FISCAL ITEM</u>	<u>SOURCE OF INCOME<sup>1</sup></u>		
	<u>Parking Garage</u> (482 spaces)	<u>Retail Shops</u> (28,000 sq. ft.)	<u>Total</u>
Annual Gross Income.....	\$214,200	\$68,500	\$282,700
Operating Costs.....	99,400	17,500	116,900
Net Income.....	\$114,800	\$51,000	\$165,800
Annual Debt Service.....	87,000	26,800	113,800
Reserve.....	\$ 27,800	\$24,200	\$ 52,000
Coverage.....	1.32	1.90	1.46

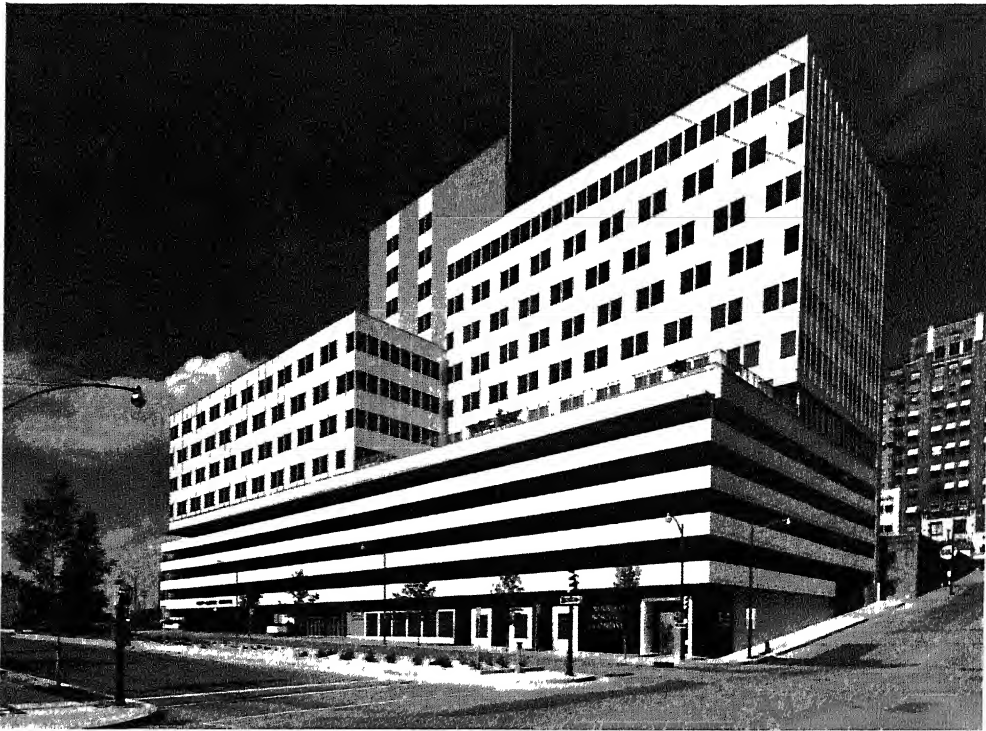
<sup>1</sup>Computed for fifth year of operation; 40-year debt service, 4.25 per cent interest.  
SOURCE: *Fifth Annual Report, Wilmington Parking Authority Facilities, Wilmington, Delaware*, Wilbur Smith and Associates, 1963.

congested districts like Chicago's "Loop," a large proportion of land area is not profitably developed above the ground floor; upper stories are frequently occupied at low rents by small manufacturing or warehousing operations which could be better conducted elsewhere. Moreover, retail stores can improve the character of surrounding shopping areas and maintain continuity of block frontage.

There are also obvious economic advantages to combined parking-office buildings, which permit spreading of land costs over the entire project and which create "built-in" parking demands. Examples of such facilities are the Americana Building garage in Houston and the AT and T Building in Kansas City.

**Cost-Income Comparisons** – The annual gross income per parking space depends primarily on its location and the type of operation. It ranges upward to \$800 per space for garages in cores of large urban centers. Facilities that primarily serve short-term parkers usually have the highest daily and annual gross incomes.

In general, revenues for off-street parking facilities average slightly more than \$1.00 per day per space. This figure is substantiated by a study of 18



AT & T BUILDING  
KANSAS CITY, MISSOURI

municipal garages (1961) which established an average annual revenue of \$338 per space with a range of \$141 to \$491.<sup>22</sup>

Six garages developed in the central area by the City of Chicago provide 4,823 spaces. The total gross revenues in 1963 of \$2,138,872 represent an average of \$443 per space and ranged from \$110 to \$738 for individual garages.<sup>23</sup>

The average annual operating costs, average gross income, and annual net income for these 18 municipal garages are shown in Table 11. Detailed cost breakdowns, given for both attendant and self-parking, clearly denote the advantages of self-parking.

Annual operating costs per space averaged \$137 per year for self-parking and \$176 for attendant parking (including a management fee for a private operator). The average cost per parker approximated \$0.25 for self-parking, as compared with \$0.36 for attendant parking. Operating costs for self-parking represented about 41 per cent of the total gross income, as compared with 52 per cent for attendant parking.

<sup>22</sup>R. E. Whiteside, *Parking Garage Operation*, The Eno Foundation for Highway Traffic Control, Saugatuck, Connecticut, 1961.

<sup>23</sup>*Annual Report 1963*, Bureau of Parking, Department of Streets and Sanitation, City of Chicago.

TABLE 11

## ANNUAL COST-INCOME DATA FOR 18 SELECTED MUNICIPAL GARAGES

A. ITEMIZED BREAKDOWN OF ANNUAL OPERATING COSTS				
FISCAL ITEM	COST PER SPACE		COST PER PARKER	
	Self-Parking	Attendant-Parking	Self-Parking	Attendant-Parking
Salaries	\$ 76.68	\$115.64	\$0.134	\$0.248
Insurance	8.36	8.36	0.018	0.018
Utilities	11.90	11.90	0.021	0.021
Maintenance and Others	23.69	23.69	0.044	0.044
Management Fee	15.97	15.97	0.031	0.031
TOTAL	\$136.60	\$175.56	\$0.248	\$0.362
TOTAL Excluding Management Fee	\$120.63	\$159.59	\$0.217	\$0.331
B. ANNUAL NET INCOME				
FISCAL ITEM	PER SPACE		PER PARKER	
	Self-Parking	Attendant-Parking	Self-Parking	Attendant-Parking
Gross Income	\$338	\$338	100%	\$0.65
Operating Cost	137	176	41%	52%
Net Income	\$201	\$162	59%	48%
			62%	\$0.29
				45%

SOURCE: R. E. Whiteside, *Parking Garage Operation*, The Eno Foundation for Highway Traffic Control, Saugatuck, Connecticut, 1961.

The increased cost was directly related to the additional personnel required. Personnel costs averaged about \$0.25 per parked car for attendant parking and slightly under \$0.15 for self-parking garages; they approximated half of the total garage operating costs for self-parking, and two thirds for attendant parking. In each case, taxes, insurance, maintenance, and utilities accounted for the remainder.

Thus, to reduce personnel costs, garages are increasingly designed for self-parking. Comparative costs for an 800-space facility, Table 12, illustrate the savings that can accrue. Total annual operating costs for attendant parking

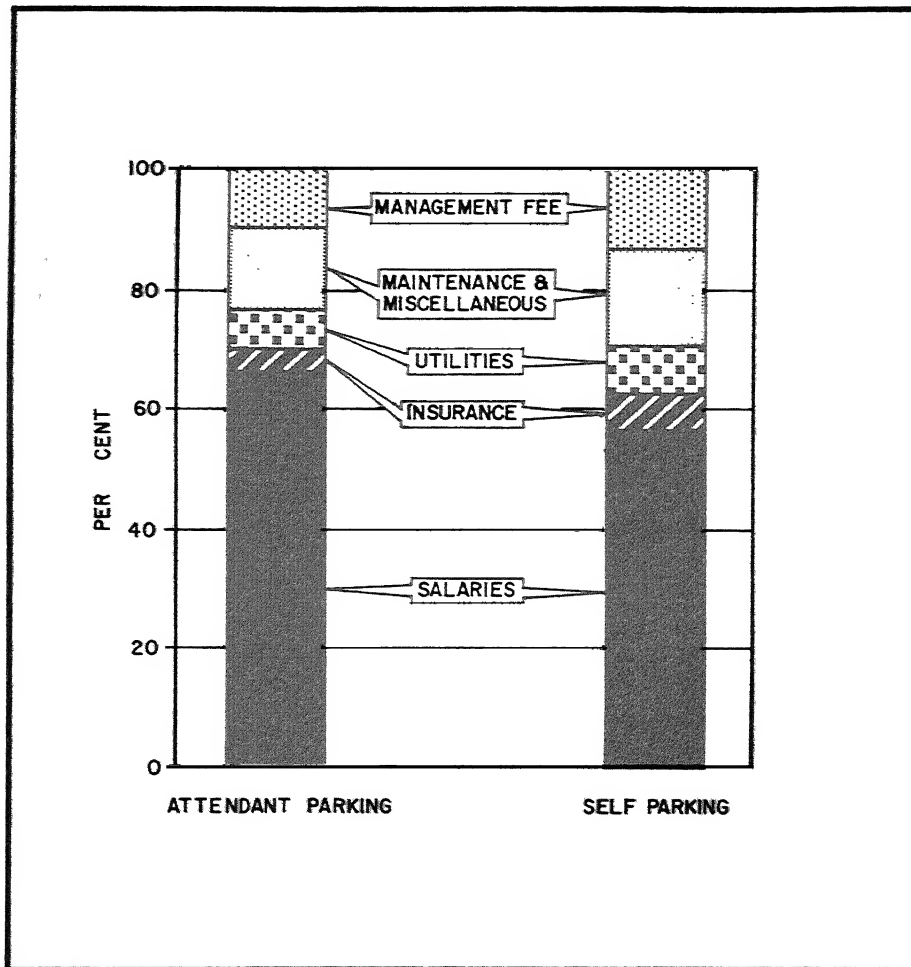


FIGURE 20

#### ANNUAL GARAGE OPERATING COSTS

This chart shows the percentage distribution of annual operating costs for attendant and self-parking garages, based on analyses of 18 municipal garages. In both cases, personnel expenses were the largest single category. Source: R. E. Whiteside, *Parking Garage Operation*, The Eno Foundation for Highway Traffic Control, Saugatuck, Connecticut, 1961.

TABLE 12  
COMPARATIVE OPERATING-COST DATA  
FOR TYPICAL 800-SPACE GARAGE

<u>ITEM</u>	<u>ANNUAL OPERATING COSTS</u>	
	<u>Self-Parking</u>	<u>Attendant-Parking</u>
Personnel.....	\$ 66,991	\$118,535
Employee Taxes.....	2,093	4,735
Insurance Premiums.....	4,292	5,469
Heat.....	1,896	2,623
Lights.....	4,907	4,736
Water.....	242	132
Maintenance.....	11,723	14,098
Depreciation.....	513	513
Supplies.....	1,944	2,209
Management Fee.....	25,000	25,000
Other Expenses.....	6,610	16,541
<b>TOTAL.....</b>	<b>\$126,211</b>	<b>\$194,591</b>

SOURCE: R. E. Whiteside, *Parking Garage Operation*, The Eno Foundation for Highway Traffic Control, Saugatuck, Connecticut, 1961.

averaged \$194,591 of which \$118,535 represented labor costs; operating costs after conversion to self-parking were reduced to \$126,211.

If the facility were originally developed as a self-parking garage, its total annual operating costs would have been even less. Thus, a garage designed for self-parking usually has a vastly better fiscal picture than either an attendant parking garage or a garage subsequently "converted" to self-parking operations.

Parking costs are also influenced by the methods of financing employed. Several methods have been successfully used by both private developers and public agencies.

To illustrate, a self-parking garage such as Wilmington's 482-space Mid-Town Parking Center, conveniently located near the focus of demands, averages 3.5 parkers per day. A cost-income summary for this garage, Table 13, shows gross incomes exceeding \$270,000 every year since it was opened. The average



TABLE 13

COST-INCOME SUMMARY  
MIDTOWN PARKING CENTER — WILMINGTON, DELAWARE

<i>FISCAL ITEM</i>	<i>YEAR OF OPERATION</i>				
	<i>1st</i>	<i>2nd</i>	<i>3rd</i>	<i>4th</i>	<i>5th</i>
Gross Income <sup>1</sup> .....	\$273,100	\$284,600	\$283,200	\$284,300	\$282,700
Operating Cost.....	132,300	138,300	129,000	136,400	116,900
Net Income.....	\$140,800	\$146,300	\$154,200	\$147,900	\$165,800
Average Annual Debt Service <sup>2</sup> .....	\$113,800	\$113,800	\$113,800	\$113,800	\$113,800
Reserve.....	\$ 27,000	\$ 32,500	\$ 40,400	\$ 34,100	\$ 52,000
Coverage <sup>3</sup> .....	1.24	1.29	1.35	1.30	1.46

<sup>1</sup>Includes retail income of about \$70,000 annually.

<sup>2</sup>Principal and interest, \$2,150,000 in 40-year revenue bonds at 4.25 per cent interest.

<sup>3</sup>Ratio of net income to debt service.

SOURCE: Annual reports prepared for Wilmington Parking Authority by Wilbur Smith and Associates.

annual debt payment, based on the original 40-year bond issue (4.25 per cent), approximated \$114,000. By reducing operating costs, the "coverage ratio" of annual net income to annual debt service increased from about 1.2 to 1.5. Based on present income levels, the coverage is about 1.85 times the average debt service on \$1,550,000 in outstanding bonds.

**Municipal Financing** — Cities finance garages in a variety of ways: general funds, ad valorem property taxes, special benefit assessments, and parking fees.

Major municipal parking facilities, however, generally have been developed through revenue and general obligation bond issues which finance total project costs (land and construction). Because general obligation bonds, which carry faith and credit of the city, have the lowest interest rates (3 to 4 per cent is common), financing expenses are kept to a minimum and debt service payments are guaranteed by over-all city tax revenues.

Revenue bonds have also proven feasible in financing off-street parking. However, they require sufficient project revenues to meet interest and principal payments, and to provide necessary reserves.

Frequently, revenues from several municipal parking facilities (including curb meters) are combined to develop an over-all parking financial plan which will provide sufficient funds to meet total debt service requirements. Thus, incomes from well patronized facilities may help support those with less usage.

**Private Financing** — Unlike public bodies, private developers are restricted in the amount of borrowing they may incur. Based on present practices, generally up to two thirds of total project costs may be financed. Interest rates range up to six per cent for a 25-year loan.

Insurance companies have financed many garages developed by private enterprise during recent years. Frequently, they have a basic interest in downtown parking because of their many property investments. Therefore, they are likely to actively encourage strengthening of downtown through parking, improved access, and beautification.

The various methods used by private enterprise in financing parking facilities display considerable ingenuity. For example:

- Two competitive department stores cooperatively developed a parking garage, jointly providing equity for a loan.
- A downtown merchants' association erected a self-parking garage on the site of a parking lot owned and operated by the association for several years.
- Two leading department stores guaranteed enough parking tickets to meet operating expenses, taxes, and debt service for a garage.
- A department store leased a facility at a rate equal to total debt service.
- A parking association developed four facilities where merchants subscribed the equity funds — a clear example of full cooperation between city and merchants (the city policed the lots and collected meter funds without special compensation).
- A bank leased the ground floor of a parking garage for a drive-in facility, paying a rental that provided operating expenses and financing charges for the entire building.
- A major department store, desiring a parking garage nearby, acquired the necessary land, and leased it to a leading operator under an agreement which required no rental payment until operating and financing expenses had been met. The store also agreed to pay real estate taxes. Virtually all construction costs were financed, and the balance was obtained through a second mortgage by a leading oil company interested in supplying its products to the garage users.

These examples illustrate various ways of providing necessary equity capital (usually up to one third of the total cost) and of guaranteeing debt service, the two basic criteria reviewed by lending agencies. Other factors considered include design (self-parking is becoming required by certain lend-

ing agencies), experience of the operator, and competition from other facilities. In evaluating a garage's financial feasibility, consideration increasingly is given to the service it will perform in relation to adjacent businesses or buildings.

**Opportunities for Private Development** — Comparative costs for private and municipally developed off-street parking facilities define the opportunities for private enterprise in downtown parking. Costs per space are related to costs per parked vehicle and parking turnover for both public and private financing. Estimated costs per parker for various space costs and financing methods are shown in Figure 21.<sup>24</sup> This chart relates costs per space to costs per vehicle for both public and private financing.

With municipal financing, assuming a total cost of \$3,000 per space, incomes of about \$0.63, \$0.44, and \$0.37 respectively, would be needed for each parker, assuming turnovers of one, two, and three parkers per space per day. These figures include estimated operating costs of 25 cents per parker. To achieve a coverage ratio of 1.5 (ratio of net income to debt service), required incomes per space would be \$0.83, \$0.54, and \$0.45, respectively.

With private development, assuming a total cost of \$3,000 per space, incomes of about \$1.08, \$0.67, and \$0.53, respectively, would be required for turnovers of one, two, and three parkers per day.

A further comparison of public and private parking developments is given in Table 14 for two 600-space garages located in Pittsburgh and Buffalo. For municipal development, coverage rates approximated 1.5 in Pittsburgh and 1.8 in Buffalo. For private development, rates of return on investment would approximate five per cent in Pittsburgh and 10 per cent in Buffalo. The Pittsburgh garage was leased by an adjacent department store at an annual lease equal to debt service. In Buffalo, a group of merchants and businessmen formed a non-profit organization and leased the garage for an amount equal to the debt service, with all profits returned to the city in lieu of taxes and applied for early bond retirement.

Cost-income comparisons for 18 municipally-developed garages are averaged in Table 15.<sup>25</sup> The total development costs of \$3,687 per space are based on assumed financing with 40-year bonds at four per cent interest; one year was allowed for construction, leaving 39 years of operation. With an average gross income of \$338 and an operating cost of \$137, there would be a net income of \$201 per space per year. Annual debt service (assuming financing of the entire cost and including both principal and interest) would be \$188 per space. Therefore, the total net income per space would exceed debt service by \$13 per year. The ratio of annual net income to annual debt service

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<sup>24</sup>The assumptions were 306 operating days per year, exclusive of Sundays and holidays; for *municipal development*, issuance of 30-year bonds at four per cent interest with one-year construction and 29 years of actual operation; and, for *private development*, financing two thirds of the facility with 25-year bonds at six per cent interest, one-year construction period, and 24 years of actual operation.

<sup>25</sup>R. E. Whiteside, *Parking Garage Operation*, The Eno Foundation for Highway Traffic Control, Saugatuck, Conn., 1961.

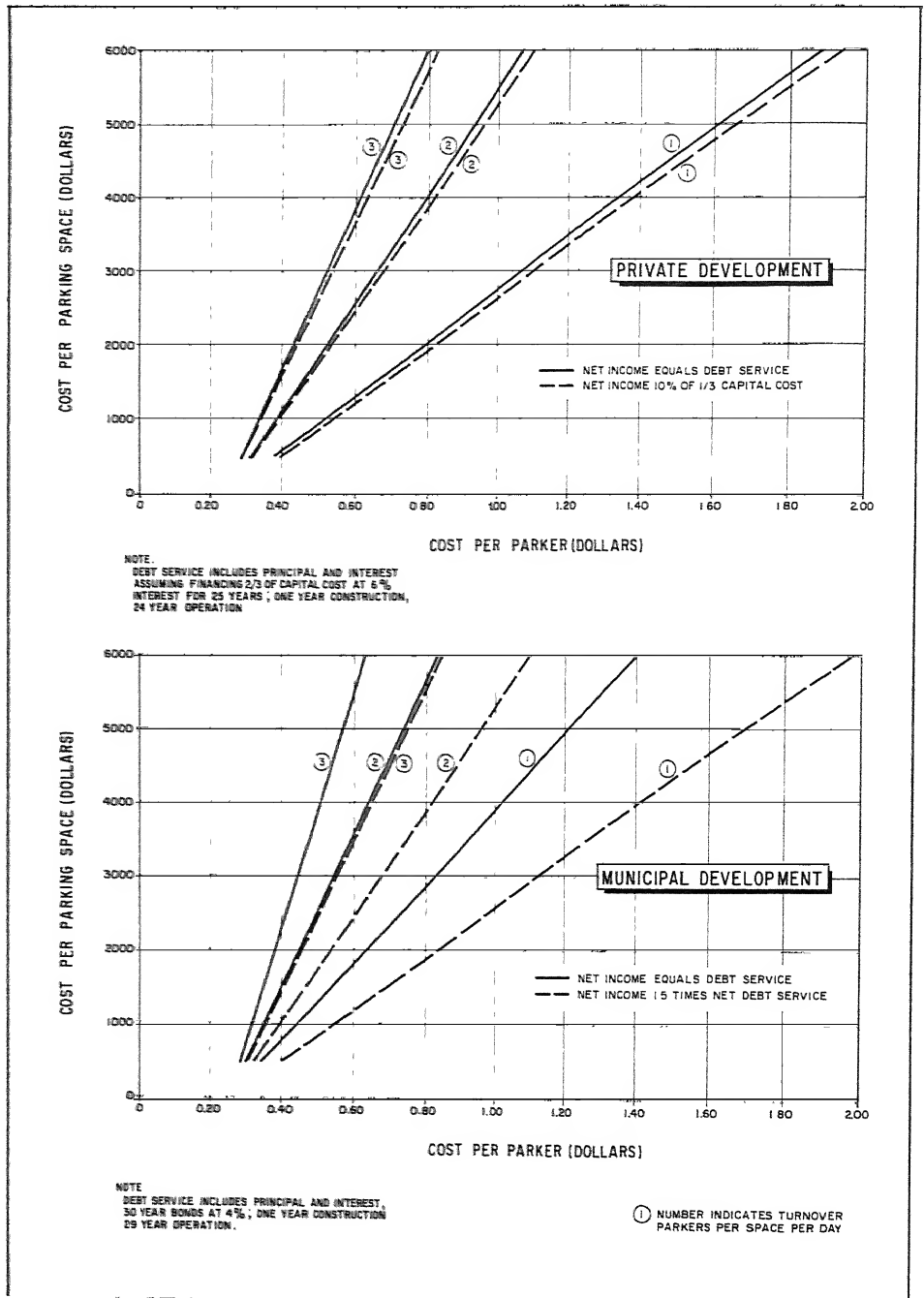


FIGURE 21  
 REQUIRED COST PER PARKER

TABLE 14

COMPARATIVE PUBLIC AND PRIVATE DEVELOPMENT  
OF TWO TYPICAL GARAGES

ITEM	FACILITY		
	Fort Duquesne Garage Pittsburgh, Pa. (605 spaces)	Eagle Ramp Buffalo, N. Y. (611 spaces)	
	Public Development	Private Development	Public Development
Total Development Costs .....	\$3,530,000	\$3,530,000	\$1,368,800
Total Financed .....	3,530,000	2,360,000	1,368,800
Annual Gross Income .....	431,500	431,500	204,000
Annual Operating Costs .....	157,300	132,300 <sup>1</sup>	64,400
Annual Net Income .....	\$ 274,200	\$ 299,200	\$ 139,600
Assumed Real Estate Taxes <sup>2</sup> .....	—	\$ 53,000	\$ 21,000
Annual Net Income (After Taxes) .....	\$ 274,200	246,200	\$ 139,600
Annual Debt Service .....	184,000 <sup>3</sup>	189,500 <sup>4</sup>	75,600 <sup>5</sup>
Reserve .....	\$ 90,200	\$ 56,700	\$ 64,000
Coverage <sup>6</sup> .....	1.49	—	1.84
Per Cent Return on Investment .....	—	4.8 <sup>7</sup>	—

<sup>1</sup>Parking Authority administrative charge of \$25,000 excluded.<sup>2</sup>1.5 per cent of development cost.<sup>3</sup>38-year revenue bonds at 4 per cent interest; one-year construction; 37 years operation.<sup>4</sup>25-year loan; six per cent interest; one-year construction; 24 years operation.<sup>5</sup>30-year general obligation bonds at 3½ per cent interest; one-year construction; 29 years operation.<sup>6</sup>Ratio of annual net income to debt service.<sup>7</sup>Annual net income as per cent of equity (one third of development cost).

SOURCE: Special parking studies in each urban area.

TABLE 15  
COST-INCOME COMPARISONS  
AVERAGE OF 18 MUNICIPALLY DEVELOPED GARAGES

<u>FISCAL ITEM</u>	<u>COST PER SPACE</u>
Development Costs	
Land.....	\$1,597
Construction.....	1,817
Other.....	273
TOTAL.....	\$3,687
Annual Gross Income.....	\$ 338
Annual Operating Cost (Self-Parking).....	137
Annual Net Income.....	\$ 201
Annual Debt Service <sup>1</sup> .....	\$ 188
Reserve.....	\$ 13
Coverage.....	1.07
Annual Debt Service <sup>2</sup> .....	\$ 165
Reserve.....	\$ 36
Coverage.....	1.22

<sup>1</sup>Principal and interest; 40-year debt service period at 4 per cent interest; one-year construction; 39 years operation. Assumes financing of entire cost.

<sup>2</sup>Principal and interest; 20-year debt service period at 6 per cent interest; one-year construction; 19 years operation. Assumes financing one half of development cost.

SOURCE: R. E. Whiteside, *Parking Garage Operation*, The Eno Foundation for Highway Traffic Control, Saugatuck, Connecticut, 1961.

would approximate 1.1. There is, of course, a wide range in the feasibility of specific garages.

Assuming development of these 18 municipal garages with private venture capital (based on the generally acceptable 25-year debt period financing of two thirds the capital costs at six per cent), the higher annual debt service, including principal and interest, would be \$192 per space, exclusive of depreciation or real estate taxes. On the average, approximately half the development costs could be financed to break even. Thus, the average facility would be marginal in terms of investment by private enterprise. (Although this may explain why *these* garages were developed by municipal agencies, it

does not imply that all municipal garages would be marginal investments for private development.)

While the financial feasibility of specific garages is highly variable, further analysis of the 18 garages indicates that approximately one third could be developed by private enterprise. An average annual income of about \$450 per space would provide adequate returns for financing two thirds of development costs, which is the usual maximum amount of a loan.

Extending this generalization, it is conservatively estimated that one fourth to one half of all central business district parking garages could be developed and financed wholly by private enterprise as speculative or profit-making ventures. In addition, other garages would be feasible, where land costs were shared by ground-floor retail shops.

Thus, selective opportunities exist for private development of off-street parking facilities in large city centers. There are many incentives, as evidenced by the preponderance of private parking developments in the nation's downtown cores and the relatively few failures of parking as a business enterprise. They are also apparent from the recent entry of several large auto-leasing firms into the parking business either as owners, lessees, or purely operators.<sup>26</sup>

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<sup>26</sup>N. Willett, "Filled to Capacity," *Barron's*, January 8, 1964.

## IV. RECENT TRENDS IN OFF-STREET PARKING

At its outset, motor vehicle parking took place primarily on city streets. However, as vehicle registrations increased during the 1920's and parking demands intensified, off-street garages (generally of the elevator type) were built in larger cities, augmenting parking lots which previously located on vacant land. These garages were usually designed to permit ready conversion to other uses, with only minimum external remodeling if parking operations were unsuccessful.

In subsequent years, the number of fringe parking lots for all-day parkers increased, often as interim land uses. During the 1930's, garage and parking lots frequently suffered through foreclosures brought on by the depression.

Continued post World War II growth in downtown parking demands gradually brought about a general improvement in facility design and location, as competition increased and land availability decreased. And, as cities initiated off-street parking programs in response to changing urban travel preferences, parking facilities grew in size and number.

### Typical Development Programs

Downtown off-street parking has been provided in the nation's city centers through various combinations of public and private approaches. Several case studies illustrate the methods employed.

**Baltimore** — The Baltimore Off-Street Parking Commission, established in 1947, has issued general obligation bonds totaling \$20 million to aid parking facility development throughout the city.<sup>27</sup> To date, it has spent almost \$10 million on about 30 off-street facilities containing over 7,000 spaces. Approximately 40 per cent of the bonds issued have been retired.

Since 1960, no garages have been built downtown except through the Commission. Approximately \$9 million has been allocated for providing 2,500

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<sup>27</sup>The Commission's operation is as follows: (1) Any individual or group desiring to construct a parking garage submits a plan; (2) the Commission reviews the proposed location, number of spaces to be provided, and all other pertinent details and either authorizes development of plans and specifications or withholds support; (3) when plans are approved by the Commission, it advances up to 85 per cent of costs for demolition, architectural fees, and land and construction costs; and (4) the Commission's loan is paid off by income from the facility. Rates are established to enable operators to repay loans as well as obtain profit from the total operation. Developers pay principal and interest to the Commission.



spaces in the Charles Center urban renewal project — a net gain of 1,300 spaces after demolition.

Downtown parking facilities generally have been constructed as profit-making ventures. Unlike most other city centers, no garages have been constructed by department stores or office buildings.

**Houston** — In contrast to Baltimore, nearly all of downtown Houston's parking has been constructed with private capital, usually in conjunction with development of major office buildings, banks, and department stores. The recently completed Cullen Center, Americana Building, and Humble Building all provide garage spaces either within or immediately nearby. Most new garages are located one block from Main Street, provide self-parking, and are connected to key buildings by tunnels or passageways.

Substantial gains in commercial garage and lot spaces during the past eight years coincide with Houston's rapid growth and continued downtown expansion. Core area concentration has also been reinforced by enlarged central banking establishments, since branch banks are prohibited by Texas law. Many home office buildings of large corporations, particularly oil companies, are also located downtown.

In April, 1961, there were about 25,000 off-street spaces downtown, a gain of over 10,000 (63 per cent) since June, 1953. About half this increase was in public garages. Between December, 1959, and April, 1961, 31 facilities (including five new garages) were added and 16 deleted, resulting in a net gain of nearly 1,700 spaces.

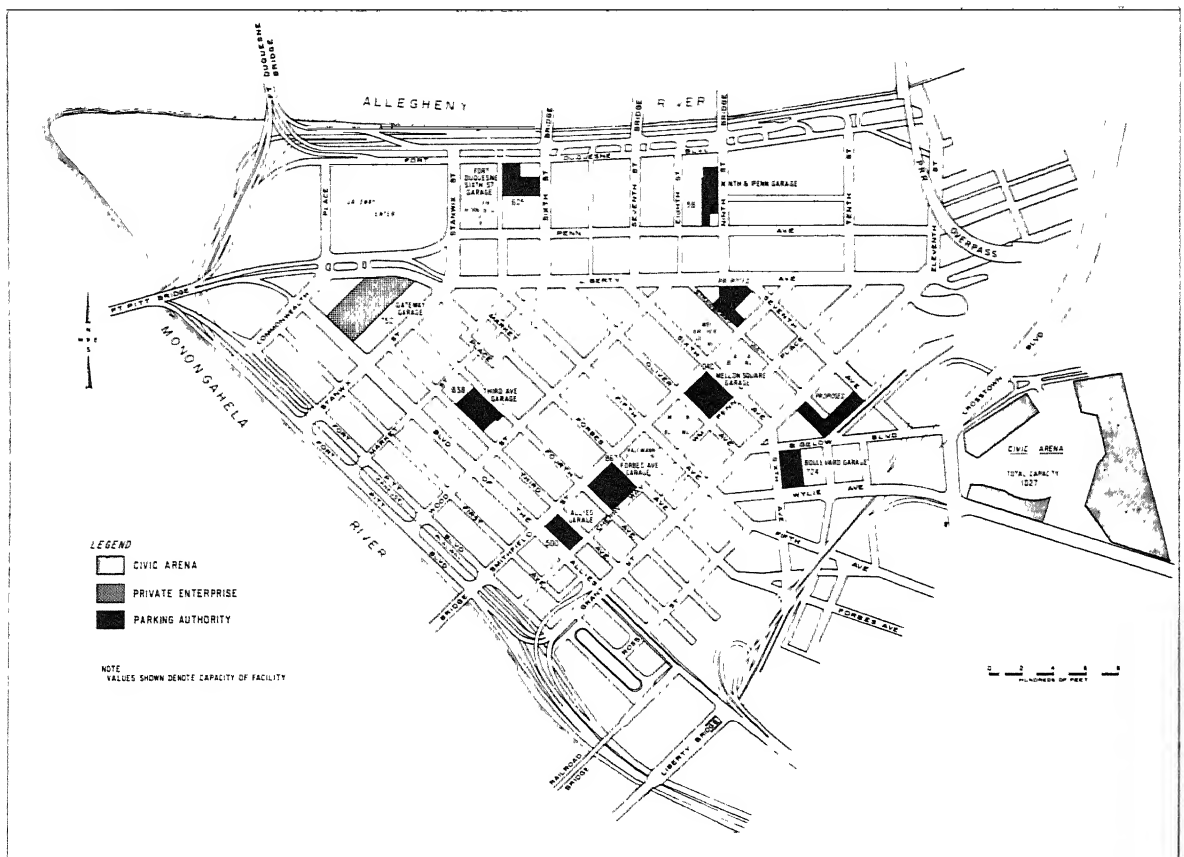
**Minneapolis** — Minneapolis clearly demonstrates the extent to which downtown parking needs can be met by private enterprise. Shortly after World War II, leading downtown retailers, savings and loan associations, newspapers, and several parking companies formed the Downtown Auto Park Corporation. This corporation acquired land, and constructed two parking garages and a parking lot.

The corporation pays income and property taxes, since no tax relief is afforded by the city. Its facilities, managed by a private operator, have proven profitable — its net worth has grown from \$600,000 to over \$970,000. At present, two additional garages are planned.

The success of this corporation has apparently stimulated many other parking developments in downtown Minneapolis. Since 1950, over 6,500 off-street spaces in 12 multideck garages have been provided; 11 facilities containing 6,000 spaces were developed wholly by private enterprise. These include garages built by two major department stores and two large banks.

**Pittsburgh** — Garage development in Pittsburgh has involved complete co-operation between the city and private enterprise. Since 1955, nearly 6,000 spaces have been provided in eight major downtown garages.

The Public Parking Authority, established in 1947, constructed six facilities, made land available for construction of a large underground garage, and has plans for developing two additional facilities. Three garages developed by the Authority have been leased by major department stores, although their use is not restricted to store patrons, nor have the garages been identified with specific stores. The two additional sites include a 600-space facility to be leased by another department store, and a facility (for which property has been purchased) to serve all-day demands created by new office building concentrations.



**FIGURE 22**

### PARKING GARAGE DEVELOPMENT — PITTSBURGH

Since 1955, eight major garages have been developed, providing nearly 6,000 spaces. The facilities, distributed throughout the downtown area, are carefully related to present and proposed street systems. In addition, surface parking lots with a capacity of over 1,000 spaces have been provided near the Civic Arena.

An underground garage (built in 1959) was financed and developed by the Equitable Life Assurance Society, as part of the Gateway Center complex of hotels and office towers. One of the few non-Authority parking garages constructed downtown since World War II, it serves the office building complex at Gateway Center and the Pittsburgh-Hilton Hotel.

Also, over 1,000 surface parking spaces have been provided by the Auditorium Authority near the Civic Arena for use by downtown employees during the day and by special-events parkers at night. Long-range plans call for a large underground parking facility and landscaping of areas currently devoted to parking.

**San Francisco** — In 1962, San Francisco's compact, intensively-developed central business district contained nearly 12,000 spaces within 33 garages. Only three garages allowed self-parking. The predominance of attendant-parking reflects the high downtown land costs and the need to maximize parking-space capacities.

The Parking Authority of the City and County of San Francisco was established in 1949, with the aim of encouraging private development of off-street parking.<sup>28</sup> Accordingly, in recent years about two thirds of all downtown parking spaces have been provided solely by private capital, and the remainder through public-private cooperation. Private enterprise, often working closely with the San Francisco Parking Authority, has provided nearly 23,000 spaces downtown since 1949, financed partly by private capital and partly by joint public-private financing. Since 1955, nearly 4,900 spaces have been provided in 12 garages.

The Parking Authority has power to go into the parking business and to receive and use curb parking meter revenues for financing needed facilities. Through a rather unique financial approach, the city provides the land through the Parking Authority and a non-profit parking corporation builds a garage. This procedure enables the city to assemble needed land through condemnation and avoid the need to obtain public approval of any borrowing program. The private corporation has only to amortize the garage cost (not the land), and no federal taxes are paid on revenues. After the original investment is amortized, the facility reverts to municipal ownership. The public enjoys minimum parking rates and public regulation. Through this technique the Union Square Underground, Fifth and Mission, Sutter-Stockton,

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<sup>28</sup>The Authority adopted a four-point policy program on March 8, 1950, in an attempt to expand off-street parking in downtown San Francisco: (1) Stimulation of, and cooperation with, private enterprise to finance and construct facilities required under the off-street parking program. In this regard, nearly 15,000 spaces have been developed since 1949. (2) Cooperation with private enterprise to provide off-street parking through public provision of garage sites for private construction. Four garages, containing 4,000 spaces, have been completed under this phase. (3) Direct public financing and construction, including site acquisition, where private construction could not develop the facilities. Three such garages with 653 spaces have been constructed and a substantial neighborhood parking district program undertaken. (4) Operation of all facilities has been entrusted to private lessees. See: *Annual Report, Parking Authority, City and County of San Francisco*, June 30, 1962.

St. Mary's Square, Civic Center Underground, and Portsmouth Square Underground garages have been constructed. Currently, over 2.3 million vehicles park annually in the Authority's 10 publicly-owned facilities.

**Washington, D. C.** — Washington has nearly 50,000 parking spaces in its central business district: 27 per cent in garages, 60 per cent in lots, and 13 per cent are curb spaces.<sup>29</sup> The construction and operation of parking facilities are wholly by private enterprise. There are currently 12 downtown garages located in office buildings, five in other buildings, and four within hotels and apartments.

## Design Concepts

Within the past decade, much progress has been made in the planning, location, and design of downtown off-street parking facilities. These advances suggest a further blending of parking into the total urban environment.

**Self-Parking** — Self-parking is common in new garages, and is increasingly acceptable to all types of parkers. It reduces manpower requirements and labor costs, lowers damage claims (drivers rather than attendants handle cars), reduces peak-hour congestion at entrance and exit points, and minimizes reservoir capacity needs.

Many existing garages, however, have design limitations and thereby require attendant-parking. These include poor internal circulation and parking patterns, dictated by column spacings and dimensions inadequate for modern car design; steep ramp systems; restricted stall widths; and absence of pedestrian elevators.

**Combination Facilities** — New downtown office buildings often incorporate garages on the first few levels, with retail shops on the ground or street level. This permits better visual and functional integration into the core area, maximizes convenience to office buildings, and assures long-term marketability. These "integral parking facilities" are an added inducement for prospective tenants, and afford patrons direct and convenient all-weather access. Many of their parking spaces can be reserved for employees and/or shoppers.

Combined facilities can reduce development costs, since both land and construction costs can be prorated according to ground floor area devoted to retail, office, and parking uses. (Or, alternatively, land costs could be allocated totally to non-parking uses.) From a community standpoint, dual-purpose buildings have another important value: they minimize the disruption of downtown frontage, thus permitting greater land-use intensity.<sup>30</sup>

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<sup>29</sup>Generally the area to the south of Massachusetts Avenue. This does not include all of Sector "Zero" as designated in origin-destination studies.

<sup>30</sup>Air rights above existing garages are also leased or sold for construction of high-rise buildings. For example, the Pennsylvania General Assembly during 1963 authorized municipal parking authorities to sell air rights above garage developments for building construction.

**Connections** — Certain downtown buildings, particularly department stores, have provided physical connections between parking garages and buildings, normally across city streets or alleys. These connections provide desirable advertising values, identify parking with specific generators, facilitate pedestrian circulation to selected levels, and eliminate conflicts between pedestrians and cars.

Direct connections include those provided at Famous Barr, St. Louis; Rich's, Atlanta; Bon-Marche, Seattle; The May Company-Statler-Hilton Hotel and Brown Palace Hotel, Denver; Macy, White Plains; and Sears, Kansas City. In Philadelphia, the Strawbridge and Clothier-Lit Brothers' garage will span streets to connect the buildings.

**Coordination with Freeways** — Parking under and over freeways is becoming more common and is increasingly encouraged by federal and state highway officials. Coordination of freeways and parking facilities achieves economy of land use and minimizes travel on surface streets, particularly as downtown freeway loops are completed. Examples of successful coordination include Chicago's Grant Park lots and garage, Detroit's Cobo Hall garage, New Haven's Temple Street garage, and Hartford's Constitution Plaza garage.

In many cities, parking facilities are located along streets which lead directly to freeways. Fifteenth and Sixteenth Streets in Philadelphia, for example, will link several large parking facilities with the downtown freeway loop, while Fifth and Sixth Streets will connect the Independence Mall underground garage with these freeways.

## Garage Types

Parking garages may be classified by their general type — above ground, underground, or integral — or by their means of interfloor travel — ramp or elevator-mechanical. Ramp garages permit either self-parking or attendant operation, while mechanical garages require attendants.

**Underground Facilities** — Underground parking garages are normally developed on sites where property is publicly owned, land is very expensive, and/or certain esthetic values must be preserved. Although ventilation, illumination, and utility relocation costs are high, these facilities are usually developed with little or no land cost, since the surface can be retained for other uses. Where high-rise buildings are located on garage sites, development costs closely conform with those for above-ground multideck structures.<sup>31</sup>

Successful underground garages include Pershing Square, Los Angeles; Union Square, San Francisco; Mellon Square, Pittsburgh; Grant Park, Chicago; the State House, Columbus; The Auditorium Plaza, Columbus; the Common,

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<sup>31</sup>Factors which influence the design and cost of underground facilities include: type of excavation required, location of water table, and relocation of various underground utility lines (viz. sewer, steam, electrical, or, in some instances, subways). Mechanical ventilation required by various safety and building codes is more expensive to operate.

Boston; and Military Park, Newark. Underground facilities currently being developed include Boston's Prudential Center, New Haven's "Front Block," Philadelphia's Independence Mall, and Baltimore's Charles Center.<sup>32</sup>

One of the newest such facilities is the three-level 1,800-car garage under a large portion of Rochester's Midtown Plaza. This downtown redevelopment project also includes two department stores, a hotel in an 18-story tower, and an air-conditioned shopping arcade. Although the two department stores developed the plaza, the garage was constructed by the city.<sup>33</sup>

**Mechanical Garages** — These garages utilize some form of electric or hydraulic elevators and machinery to position cars in stalls. They permit construction of a greater number of levels and adapt to small and irregular properties.<sup>34</sup> An often critical disadvantage, however, is their inability to accommodate heavy peak-hour incoming or outgoing movements.

**Ramp Garages** — Ramp garages provide either (1) parallel floors with ramp connections at one or more locations, or (2) sloping floors which permit parking on both ramp surfaces and building floors (see Figure 23 and 24). Sloping floor garages have continuous grades, and cars are driven in an elongated spiral pattern to upper floors and brought down by the same system of aisles. Some designs feature spiral ramps which facilitate rapid descent from upper floors. Facilities may incorporate one or more levels of underground or basement parking, and take advantage of topography to provide multilevel entrances or exits.

## Design Standards

The size, dimension, and over-all weight of modern automobiles and trucks have been key factors in determining off-street parking standards. Throughout the United States, building codes are constantly being revised to accommodate necessary live loads required in final designs for both multideck and roof level parking garages.

Modern design standards for self-parking garages pertaining to access points,

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<sup>32</sup>Ultimate plans for Baltimore's Charles Center urban renewal project call for 4,000 underground spaces. At present, one office building with 275,000 square feet of office space and 30,000 square feet of retail space is under construction. Eventually, the area will include several more office towers, a federal office building, a new 530-room hotel, two apartment towers, and a legitimate theater.

Source: *Engineering News Record*, January 31, 1963.

<sup>33</sup>See: *American City Magazine*, December, 1962. The garage has accommodated as many as 12,000 cars per day at peak ingress rates of 1,200 cars in 30 minutes. Trucks and service vehicles utilize the garage for servicing of stores and buildings. An automatic computer specifies the number of cars and locations parked; automatically actuated directional signs direct drivers to available spaces; traffic signals are used internally where ramps merge; and closed circuit television monitors each level for safety and protection of vehicles against vandalism.

<sup>34</sup>A new design recently installed in New York City is entirely electronic, and requires only one cashier-attendant for an eight-level, 270-car mechanical garage. A key is inserted in the control equipment, actuating positioning of the car and the timing mechanism for any specific stall. The location by stall number is indicated on the parking receipt given to the patron.

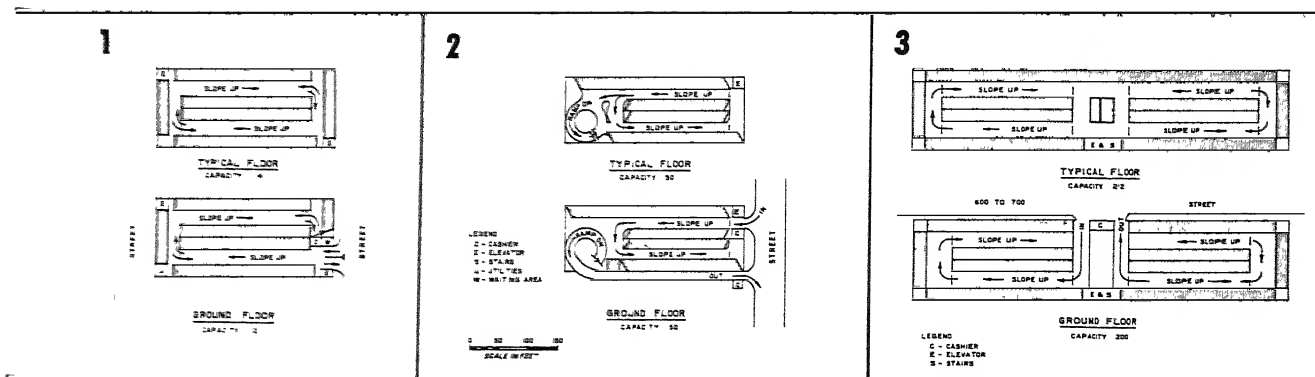


FIGURE 23

### TYPICAL SLOPING FLOOR GARAGE DESIGNS

(1) Conventional Single Sloping Floor; (2) Single Sloping Floor with Express Exit Ramp; and (3) Double Sloping Floor.

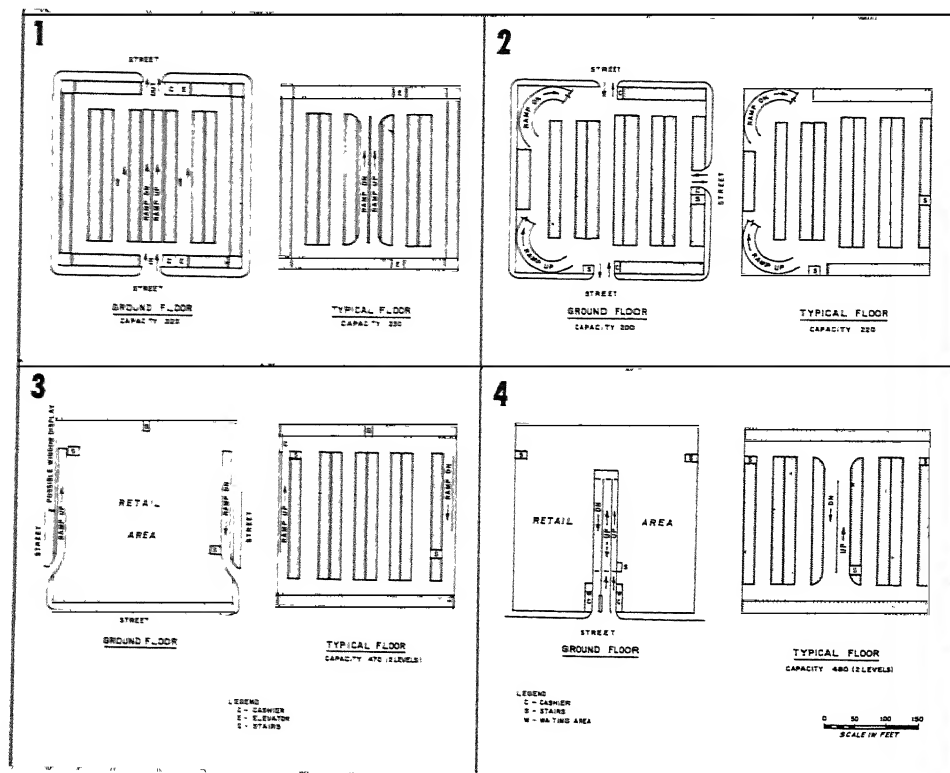


FIGURE 24

### TYPICAL RAMP GARAGE DESIGNS

(1) Straight Ramp; (2) Spiral Ramps; (3) Directional Ramps with Retail Area; and (4) Straight Ramps with Retail Area.

unit parking dimensions, column spacings, floor heights, and ramp grades are briefly summarized herein. Only general criteria are presented, for the detailed design of parking garages is a complex study in itself.

**Entrance and Exit Lanes** — Access points between garages and surrounding streets should avoid back-ups and congestion. At least one outbound lane usually should be provided for each 300 spaces and one inbound lane for every 500 spaces. Lanes should be 12 feet wide except at points of ticket issuance or cashier collection, where they should taper to about 10 feet.

**Unit Parking Dimensions** — The parking unit (including two parking stalls and an aisle) varies with the "parking angle." Although angle parking is sometimes more readily acceptable to many shoppers and business-trip parkers, greater space economy is usually achieved from 90-degree parking. Suggested unit parking dimensions for 45, 60, and 90-degree parking are given in Table 16.

Minimum stall widths should be 8.5 feet for angle parking, 9 feet for 90-degree parking, and approximately 10 feet for parallel parking. The length of a stall (measured on an axis parallel with the vehicle after it is parked) should be 18 feet. For parallel parking, this length should range from 22 to 24 feet.

TABLE 16  
SUGGESTED UNIT PARKING DIMENSIONS

<u>ANGLE OF PARKING</u>	<u>DIRECTION OF AISLES</u>	<u>UNIT PARKING DIMENSION</u>
45°	one-way	48 to 53 feet
60°	one-way	57 to 60 feet
90°	two-way	62 to 65 feet

**Column Spacing and Clear-Span Construction** — Traditionally, columns have been spaced at intervals of three parking spaces. This results in a 28.5-foot spacing, assuming 90-degree parking and 18-inch columns. Because columns are located three feet in from aisles, a parking unit of 62 feet requires an over-all minimum column spacing of 31 by 28.5 feet. For larger columns, this spacing should be increased accordingly to maintain adequate clearances.

The "column-free" or "clear-span concept" has been widely used to provide spans up to approximately 65 feet for 90-degree parking. Various theories and revisions in materials, design concepts, and building methods have aided in making this concept a reality. These include "ultimate strength" design, pre-



stressed concrete, post-tensioned construction, and new steel and concrete products with greater tensile and compressive strengths which permit longer spans with less deflection.

**Floor Heights** — Floor-to-floor heights usually depend on construction methods. A minimum clear height of approximately 7.5 feet will normally dictate a 9.5 to 10-foot floor-to-floor height.

**Ramp Grades** — A maximum grade of five per cent should be used for sloped portions of sloping floor garages where ramps provide direct access to stalls. Where conventional interfloor ramps are used (either straight or helical), grades should not exceed 10 to 13 per cent; grades of seven to eight per cent are preferable. Parking should not be permitted directly off conventional interfloor ramps.

**Lighting Intensity** — Garage illumination should approximate three to five foot-candles in parking areas, and 30 foot-candles in cashiering and waiting areas.

## V. PARKING POLICY AND DOWNTOWN TRANSPORTATION PLANNING

Parking policies should reflect the interaction of market forces on downtown land use. Public policy, therefore, should view parking as a vital component of the total urban transportation system and should effectively coordinate parking with arterial streets, freeways, and public transportation.

### Encouraging Short-Term Parking

Off-street parking facilities should complement other transport media in stimulating downtown investment and improving downtown's attractiveness and competitive position within the urban region. Broadly construed, the conveniences and services provided are the basic reasons for parking facility development.<sup>35</sup>

Ideally, each downtown parking space should maximize the convenience it affords to adjacent land uses by serving as many parkers as possible. This implies maximum development of short-term parking in core areas, particularly in central business districts of large urban complexes. While this will largely emerge from normal economic processes, it could also be encouraged by public policy.

Design and rate schedules should, therefore, encourage short-term parking and maximum turnover in core garages; facilities for all-day parkers should be located on the fringes of the central business district. Care, however, must be exercised in establishing rate schedules that relate to free market forces and that do not discourage investment in the city center.

*In the largest urban centers, wherever possible and within the constraints of over-all supply-demand relationships, it may be desirable to encourage all-day parking at both outlying freeway access points and express transit stations. This suggests a "progressive pricing policy" in which long-term parking costs are high downtown, and minimal (or free) in outlying areas. This policy would help retain transit for home-to-work trips and simultaneously provide maximum convenience for persons traveling to or from downtown by auto for business or shopping purposes.*

Boston's Finance Commission, for example, recently suggested that the city modify rate structures in eight municipal parking garages to encourage

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<sup>35</sup>New York City's Pan-Am building serves a daytime population of 17,000. Although such a concentration obviously depends on rapid transit, a garage is an integral part of the structure, mainly for visitor convenience.

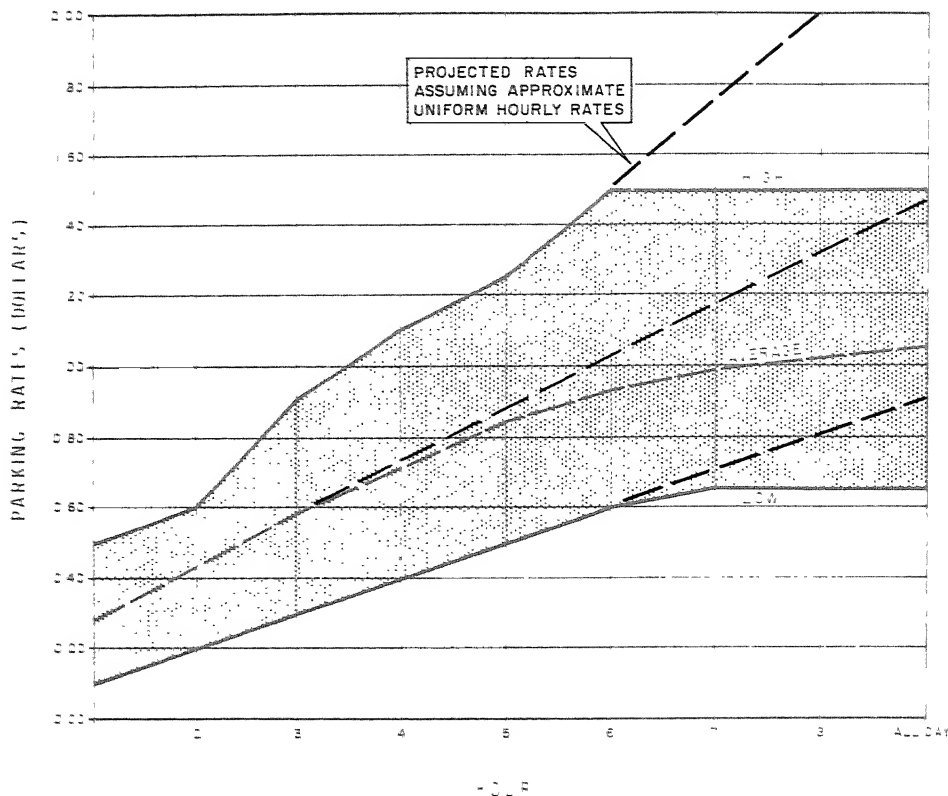


FIGURE 25  
AVERAGE PARKING RATES FOR MUNICIPAL GARAGES

This drawing shows parking rates in 18 municipal garages in 1961. Rates varied from 10 to 50 cents for one hour parking, and averaged about 28 cents. Up to five hours the hourly increase averaged about 14 cents and the average fee for all-day parking was \$1.05. The first-hour fee averages about one fourth the all-day charge. Monthly fees for reserved spaces averaged 18 times the normal transient all-day charge. The drawing also shows effects of uniform rate schedules on all-day parking costs. Source: R. E. Whiteside, *Parking Garage Operation*, The Eno Foundation for Highway Traffic Control, Saugatuck, Connecticut, 1961.

short-term parkers, and discourage all-day users.<sup>36</sup> Currently, two thirds of the garage users are commuters, many of whom come from suburban areas. Adjustment of rates comparable to those of private facilities would help eliminate a substantial annual deficit, reduce peak-hour congestion, and encourage additional transit use.

In striking contrast, possibilities exist for providing free downtown parking in smaller urban areas — usually those in the 50,000 to 150,000 population category. Such a policy might enable their cores to better compete with retail outlets located elsewhere in the urban complex.

<sup>36</sup>*Boston Record American*, June 20, 1964.

Finally, as a corollary to off-street parking rate policies, the free use of downtown streets for parking should be discouraged, particularly in large cities. Where curb parking is not permanently prohibited, it should be reserved only for short-term access to adjacent properties.

## Coordinating Parking with Transport Terminals

Off-street parking facilities adjacent to freeway interchanges, rapid transit stops, or commuter railroad stations are valuable adjuncts to the transportation system in large metropolitan regions. The importance of outlying parking with good approach highway access is apparent from the high percentage of suburban railroad passengers and the substantial proportions of rapid transit riders in suburban areas that arrive at stations by car — half or more of all riders at selected stations.<sup>37</sup>

Thus, downtown parking can be complemented by outlying parking areas which are carefully integrated with freeways, major streets, and express transit facilities. Sometimes, these terminals can become a basic part of neighborhood or community site plans — as exemplified by Vallingby and Farsta near Stockholm, Sweden.

The planning of new suburban communities or satellite towns should, therefore, carefully coordinate the location and design of shopping and/or community centers, transit stations, and freeways and off-street parking facilities to permit joint use of certain spaces by shoppers, visitors, and commuters. This is feasible, since peak shopper-parker demands typically occur on Saturdays and during mid-evening hours on weekdays, when commuter parking demands are virtually nil.

Successful outlying parking requires provision of fast and frequent express transit or highway service to downtown, short walking distances between parking lots and transit stops, easy access to and from major traffic arteries, and ample parking capacity for both local shoppers and downtown-oriented travelers. Parking should be free or low-cost. Because applicability depends on careful economic analysis, fringe parking facilities will usually be developed in suburban (or even semi-rural) locations with comparatively low land costs.<sup>38</sup>

Estimates of the desired amounts of outlying parking along freeway and rapid transit facilities are presented in Table 17. Facilities will be particularly

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<sup>37</sup>Approximately 20 per cent of all loop-bound rapid transit and commuter railroad riders in Chicago make the first part of their trip as auto drivers or passengers. About 14 per cent of the 9,000 inbound riders on Chicago's Congress rapid transit route during a typical morning peak hour arrived at stations by automobile, and nearly 40 per cent of the 1,400 people entering at the end of the line arrived by car. Similarly, about 45 per cent of the 3,600 people boarding the Cleveland Rapid Transit System at the two westernmost stations — about a fourth of the total inbound "Westside" riders — arrived by automobile.

Source: W. S. Rainville, et al., "Preliminary Progress Report of Transit Subcommittee, Committee on Highway Capacity." *Proceedings*, Highway Research Board, 1961.

<sup>38</sup>Frequent parking, for example, exists along selected interchanges of Connecticut's Merritt and Wilbur Cross Parkways.

TABLE 17

ESTIMATED OUTLYING PARKING REQUIREMENTS  
ALONG FREEWAYS OR RAPID TRANSIT ROUTES

<u>URBANIZED AREA POPULATION</u>	<u>GENERAL RANGE IN OUTLYING PARKING SPACES AS PER CENT OF CBD PARKING SPACES</u>
500,000 .....	10-20
1,000,000 .....	15-25
2,000,000 .....	20-30
5,000,000 .....	25-35

SOURCE: Estimated from existing practices, relationships between downtown person trip generation and parking, and possible regional transportation system configurations.

beneficial in urban regions which exceed 2,000,000 population, where they may approximate one third of the downtown parking space supply.

Outlying parking facilities can both maximize user convenience and reduce "line-haul" capacity requirements. They permit principal portions of downtown trips to be made either at higher passenger occupancies on freeways, or by public transit, without reducing convenience of the "home" origin. In many cases, their design can reduce walking distances, thereby helping attain more attractive time-distance relationships to the urban core than those afforded by large fringe parking areas on the perimeter of downtown.

They may also reduce (although not eliminate) parking requirements on the periphery of the CBD's in larger cities, enabling this land to be used for other purposes. Thus, they may serve to achieve an equilibrium between downtown parking supply and demand *without* discouraging downtown activity or travel.

### Zoning for Parking

Zoning for parking is an important means by which cities can guarantee an adequate amount of off-street parking in new developments. Zoning should be based on a careful appraisal of off-street parking needs for specific land uses.

Typical zoning requirements and suggested planning standards are set forth in Table 18. These values define the number of off-street parking spaces that should be provided by various residential and commercial units.

**Residential Parking** — Residential parking requirements for both private residences and multifamily dwellings are an essential part of modern zoning ordinances.

TABLE 18

TYPICAL ZONING REQUIREMENTS, INDICATED PARKING SPACE  
NEEDS, AND SUGGESTED PLANNING STANDARDS

LAND USE	RANGE IN NUMBER OF PARKING SPACES PER INDICATED UNIT			
	Unit	Zoning Requirements	Parking Space Needs	Planning Standards
Single-Family Residence	dwelling	1-2 <sup>1</sup>	0.5-2.2 <sup>2, 3</sup>	1-2+ <sup>3</sup>
Apartment House <sup>3</sup>	dwelling	0.4-0.5 up	0.3-2.0 <sup>4</sup>	0.7-2.0 <sup>5</sup>
Hospital <sup>6</sup>	bed	0.25-1.40	0.60-1.40	1.0-1.4
Auditorium, Theater, or Stadium <sup>6</sup>	seat	0.08-0.25	0.08-0.50	0.25-0.33
Restaurant	seat	variable	N.A.	0.33-0.50
Retail	1,000 sq. ft. (gross floor area)	1.5-3.0	1.5-8.0 <sup>5</sup>	2.0-8.0 <sup>5</sup>
Office	1,000 sq. ft.	variable	2.9-4.0 <sup>7</sup>	2.0-5.0 <sup>5</sup>
Manufacturing-Warehousing	employee	variable	variable	0.33-0.50 <sup>8</sup>
College-University <sup>6</sup>	student	variable	0.4-0.6	0.5-0.7
Church	seat	0.10-0.33	N.A.	0.20-0.33

N.A. - Not available.

## SOURCES:

- <sup>1</sup>Joint Committee on Urban Traffic Congestion and Parking, J. B. Fordham, Chairman, *Parking, Legal, Financial, Administration*, The Eno Foundation for Highway Traffic Control, Saugatuck, Connecticut, 1956.
- <sup>2</sup>D. Levin, *Parking Requirements in Zoning Ordinances*, Highway Research Board Bulletin, No. 24, May, 1950.
- <sup>3</sup>A Study of Residential Parking Requirements, Los Angeles, California, Wilbur Smith and Associates, 1963.
- <sup>4</sup>Upper end of range: - Philadelphia, 0.7; Los Angeles, 2.0.
- <sup>5</sup>Varies depending on location; higher ranges apply to non-downtown locations.
- <sup>6</sup>W. S. Smith, *Access and Parking for Institutions*, The Eno Foundation for Highway Traffic Control, Saugatuck, Connecticut, 1960.
- <sup>7</sup>P. C. Box, "Parking Generation Studies," *Highway Research Abstracts* April, 1962, Volume 32, No. 4 (For suburban offices).
- <sup>8</sup>G. Baker and B. Funaro, *Parking*, Reinhold Publishing Corp., New York, 1958.

Generally, one to two off-street parking spaces should be provided for every single family residence and 0.7 to 2.0 spaces for each multifamily unit. But there are important ranges both within and among cities.<sup>39</sup>

Because many apartment units were constructed in established neighborhoods of large, old central cities before widespread automobile use, curb space along arterial or secondary streets is frequently used for local parking. To alleviate this condition, several municipalities have decided that provision of parking for residential land uses is not their direct responsibility; and some municipalities require the payment of a monthly or annual fee for the privilege of on-street parking. The most successful establishment of such an ordinance to date has been in Milwaukee; here, revenues collected are placed in a separate fund for off-street parking purposes and used to construct residential off-street facilities.<sup>40</sup> Such a policy, however, does not appear warranted universally, for problems of public acceptance have commonly arisen in cities where the greatest needs exist.

**Institutional Parking** — Colleges and universities should provide approximately 0.5 to 0.7 parking spaces per registered student. Similarly, hospitals should provide approximately 1.0 to 1.4 spaces per bed; and approximately 0.25 to 0.33 parking spaces should be provided for each auditorium seat. These ranges result from differences among facilities in public transport availability and use.

**Commercial Parking** — Parking space needs of commercial land uses relate to the amount of floor space or number of employees. Manufacturing activities generally require approximately 0.3 to 0.5 spaces per employee, while retail establishments need two or more parking spaces per thousand square feet of floor area.

Off-street parking areas at planned regional shopping centers clearly demonstrate the value and importance of attractive automobile terminal facilities. Parking occupies the largest proportion of shopping center land area and accounts for approximately 10 to 15 per cent of the total site development costs.<sup>41</sup> However, adequate parking is essential for the economic success

<sup>39</sup>For example, 750 dwelling units in central Philadelphia indicated unit parking demands of 0.58, 0.52, and 1.22 spaces for high-rise apartments, two-four floor apartments, and private houses located close to downtown. Similarly, an outlying high-rise apartment building required 0.87 spaces per unit. Unit parking demands for private residences, multifamily dwellings, motels, and hotels in Los Angeles residential areas, 1962, were 2.5, 1.6, 1.2, and 1.0 spaces, respectively.

See: Survey by Wilbur Smith and Associates reported in *Washington Square East Urban Renewal Area Unit I Society Hill Technical Report*, June, 1958. Prepared by Wright, Andrade, Amenta, Architects for the Redevelopment Authority of the City of Philadelphia. *A Study of Residential Parking Requirements*, Los Angeles, California, Wilbur Smith and Associates, 1963.

<sup>40</sup>Source: F. P. Zeidler, "Milwaukee's Parking Problem," *Traffic Quarterly*, January, 1955, The Eno Foundation for Highway Traffic Control, Saugatuck, Connecticut. The ordinance, established May, 1950, stipulated that the special privilege permit fee for all-night on-street parking shall be \$4.00 per month; \$2.00 per month if granted after the 15th day.

<sup>41</sup>Source: V. Gruen and L. Smith, *Shopping Towns, U.S.A.*, Reinhold Publishing Corporation, New York, 1960. Construction costs approximate \$21.10 per square foot of total rentable area, of which about \$2.10 are related to site development; land costs approximate 80 cents per square foot, of which about two thirds are for parking.

of the center. In most regional centers, therefore, five or more parking spaces are provided for each 1,000 square feet of floor area, and six to ten spaces per 1,000 square feet are usually required to accommodate weekly and seasonal peak demands.

**Airport Parking** — A rapid rise in airport parking demands has accompanied the phenomenal increase in air passenger travel. Although the magnitudes and proportions of the daytime airport population and parking demands vary widely among airports, several guidelines can be set forth.

Air travelers (on originating or terminating flights) generally constitute about one third to one half the daily airport population; employees, 10 to 15 per cent; and casual visitors, 30 to 40 per cent.<sup>42</sup>

The Civil Aeronautics Administration has suggested providing 1.5 to 2.0 parking spaces for each peak-hour passenger. Pilot studies of airport parking suggest approximately two parking spaces per thousand annual originating passengers.

Although these estimates vary and may somewhat understate actual air-terminal parking requirements, the need for ample off-street parking and attractive highway access is readily apparent. The success of commercial parking ventures at airports clearly indicates the high parking space demands that exist at airports today, and which will undoubtedly intensify as air travel increases. It is essential, therefore, that ample off-street parking be incorporated in air terminal design.

### **Cooperative Parking Developments**

Each central business district, by virtue of its special character, will have growing parking demands in the years ahead and will require additional off-street parking spaces. New facilities should be developed as part of an over-all transport plan related to major activity centers, street and express highway systems, and transit.

Once the quantity and spatial configuration of parking facilities are determined, necessary means of implementing off-street parking programs and achieving financing should be established. There are a variety of ways by which needed off-street parking facilities can be provided.

They may be developed and operated by the owner; developed by financial interests and leased to experienced parking operators; developed by municipal governments with operation either by cities (or parking authorities) or leased to private operators; or developed by groups of merchants or investors who

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<sup>42</sup>Based on estimates of terminals at Chicago (Midway), Dallas, Ft. Worth, Nashville, and New York.

Source: Data contained in "Planning and Design of Airport Terminal Facilities," by R. Harris and C. Michalski, 1959 *Proceedings* — Institute of Traffic Engineers, 29th Annual Meeting, Washington, D. C. and from *FAA Statistical Handbook of Aviation*, 1960 Edition, Federal Aviation Agency. Data in *Airport Terminal Activities and Space Utilization*, U. S. Department of Commerce — Civil Aeronautics Administration, July, 1950.



desire to increase convenience of specific establishments. Operation by private enterprise generally should be encouraged.

Traditionally, governmental participation in transportation has occurred only when private approaches have been unable to meet specific community needs. This philosophy should also apply to parking. Private enterprise should be given every opportunity to develop facilities which relate to specific downtown land uses or which can be developed through normal investment procedures. A large proportion of downtown parking needs can be met by private interests either as combined facilities, adjuncts to business establishments, or speculative ventures. In this regard, department stores in large cities have often assumed the role of parking facility developer, or have aided private enterprise in providing desired parking space.

Where parking needs cannot be met effectively in full by private enterprise, municipal agencies concerned with the welfare of downtown may be justified in assuming the role of parking developer. Municipal parking developments should *supplement* rather than *compete* with private parking facilities. The extent of municipal participation will naturally vary widely among cities. It should, of course, be recognized that governmental agencies already participate in virtually every aspect of urban transportation; further municipal participation in downtown terminal facilities would be in accord with this practice.

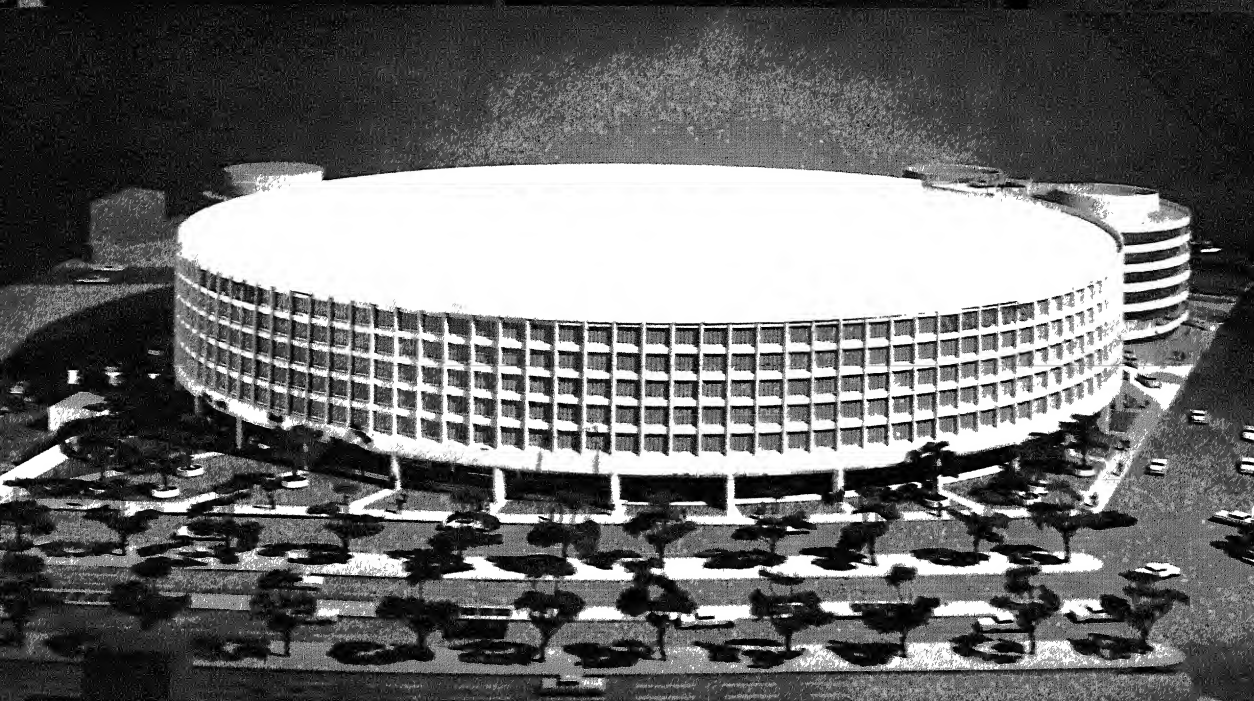
Moreover, cities should recognize parking garage developments as physical and functional extensions of urban street and highway systems. In this context, curb parking meter revenues could be pledged to the financial support of off-street parking bond issues. The same basic philosophy suggests that cities might acquire land, perhaps develop sites, and then lease them on a long-term basis to private operators. In special cases, some tax concessions to privately operated garages may be appropriate.

Cooperative developments between municipalities and private interests will further extend the role of private enterprise in meeting the nation's downtown parking needs. It is estimated that all downtown parking can pay its way through various cooperative approaches. Thus, cities and private interests, working together, can provide needed downtown parking.

### **Enhancing Parking Facility Design**

There is growing realization of the need for attractive parking garage design. Carefully integrated downtown parking and land-use plans contradict the contention that parking is incompatible with the city center. The attractive appearance of downtown parking facilities frequently induces further face lifting in the city center.

A continuation of recent design trends suggests that within the next 20 years parking structures can be expected to increase in size and further utilize high-type designs, especially at their contacts with streets. They may



# MACY'S STORE & GARAGE, QUEENS, NEW YORK

ARCHITECT: Skidmore-Owings & Merrill

TRAFFIC: Wilbur Smith & Associates

This circular 2,000-space garage, now under construction, completely circumscribes the department store, exemplifying the "integral design concept" increasingly popular in parking garage design.

span or connect directly with freeways and major streets, thereby fully adapting to the downtown circulation pattern.

Because of their close functional relationships, freeways and parking should be planned together whenever feasible. Locations of both facilities can readily be harmonized in advance planning. Moreover, no legal obstacles impede cooperative freeway parking developments today.<sup>43</sup>

Such arrangements have many advantages. They minimize the withdrawal of tax-paying land for public use. The cost of parking space is either comparable or less than it would be elsewhere. Abutting land developments may be accelerated. Finally, good architectural treatment may be spurred and thereby enhance the attractiveness of the total structure.<sup>44</sup>

Since parking facilities represent substantial capital investments, great care should be used in their design and location. Future downtown parking should involve provision of off-street spaces in multideck self-parking garages, either in free-standing buildings or as integral parts of building or plaza developments. Combined facilities will be increasingly desirable. Where land costs are high, and the special character of specific areas must be preserved, underground parking should be considered. Technological advances in garage design should try to reduce costs to about \$1,200 per space.

<sup>43</sup>*Freeways and Parking*, Automotive Safety Foundation, 1960.

<sup>44</sup>*What Freeways Mean to Your City*, Automotive Safety Foundation, 1964.

Parking facilities should generally provide 400 to 2,500 spaces. Fragmented, piecemeal approaches to downtown parking needs should be avoided. Garages located on small land parcels are generally undesirable, since they usually preclude efficient design, have difficult capacity problems on surrounding streets, and cannot effectively integrate into over-all area planning.

Parking can be an important element in the total downtown plan. Central area design should segregate pedestrians, vehicular traffic, and parking through malls, street closures, and/or separation of levels, wherever feasible.<sup>45</sup> Where land use and street patterns permit, the provision of tight, "traffic-free" core areas, with parking facilities located close to the cores, would enhance the entire central business district. These facilities, however, should be planned to permit ready expansion of downtown beyond, over and/or under parking structures.

*Thus, greater functional and visual integration of parking into over-all site planning should be encouraged, with a consequent improvement in parking aesthetics. A new urban image will emerge.*

In prospect, the nation's cities through cooperative public and private endeavors can provide ample parking for most of their downtown visitors (the principal exceptions are a portion of the home-to-work travelers in the largest urban centers who must continue to rely on public transport). This is an important step in assuring the continued vigor of their central cores, and the workability and balance of their transport systems.

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<sup>45</sup>For example, "Main Place" proposal for downtown Dallas; Lincoln Road Mall, Miami Beach; and Shoppers Mall, Kalamazoo. See: H. S. Levinson, "Operational Measures — Future," 1962 *Proceedings* — Institute of Traffic Engineers, 32nd Annual Meeting, Washington, D. C.

## VI. CASE STUDIES IN DOWNTOWN PARKING

The role and value of off-street parking in the modern city center is best understood from a detailed study of specific downtown areas. This chapter contains two such studies. It explores in depth the way parking relates to land use and economy in the Los Angeles and Hartford central business districts.

The two city centers differ in many respects, thereby affording broad bases for generalization and extension of findings to other American cities. Downtown Los Angeles is the loosely developed center of the nation's second largest urban region, encompassing over six million people; downtown Hartford is the tightly clustered commercial focus of the Connecticut River Valley.

### LOS ANGELES

Downtown Los Angeles serves a large, decentralized, automobile-oriented urban region. The city itself encompasses nearly 2.5 million persons within its 455 square mile area; Los Angeles County, its metropolitan area, includes over 6 million people.

#### **Regional Setting**

The regional freeway system focuses on Los Angeles' 6.4-square-mile "Central City Area," the region's retail, financial, and business center. The components of this area (as delineated by various studies and municipal departments) are shown in Table 19. The 400-acre "central business district" defined by the City Planning Department (the basis for subsequent analyses) forms the heart of this area.

The central business district is eccentrically located with respect to areas of contiguous growth within the city. This factor has contributed to the rise of major outlying competitive centers which are surrounded by many high-income residential communities and have assumed certain CBD activities such as restaurants, theaters, and quality shops. In addition, strong CBD's have been traditionally found in Santa Monica, Glendale, Pasadena, and Long Beach. This simultaneous regional growth from several centers has, in turn, limited downtown's focus and intensity.

Buildings occupy 64.4 per cent of the net buildable downtown land area; while 32.8 per cent is used for surface parking and 2.8 per cent is vacant. Nearly half of all downtown land is devoted to roadways (exclusive of sidewalks), alleys, or off-street parking facilities.

TABLE 19  
CHARACTERISTICS OF LOS ANGELES CENTRAL CITY AREA  
1961

SECTOR	DESIGNATION ON FIGURE 26	AREA		PARKING SPACES		TRIP DESTINATIONS (Average Weekday)				DAYTIME EMPLOYMENT			
		Acres	Per Cent	Num- ber	Per Cent	Auto Drivers	Auto Passengers	Transit Passengers	Total Num- ber	Per Cent	Per Cent		
CBD-City Planning Commission (A B D)													
1. Downtown-Traffic Department													
a. Bunker Hill	(CF <sub>1</sub> F <sub>2</sub> )	125.0	3.1	6,047	11.4	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
b. Rest of Downtown	(B D G)	345.0	8.6	29,010	54.9	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Subtotal		470.0	11.7	35,057	66.3	54,200	17,600	86,000	157,800	40.8	118,550	43.8	
2. Surrounding Area													
a. Civic Center	(AE <sub>1</sub> E <sub>2</sub> )	320.0	8.0	10,867	20.6	16,300	4,200	1,800	22,300	5.8	20,220	7.5	
b. Fringe Area													
(1) Fringe #1	(H)	170.0	4.2	6,946	13.1	20,800	5,400	700	26,900	6.9	19,500	7.2	
(2) Fringe #2		190.0	4.8	N.A.	N.A.	39,100	9,600	2,500	49,200	12.7	39,720	14.7	
Subtotal		680.0	17.0	52,870	N.A.	76,200	19,200	5,000	98,400	25.4	79,440	29.4	
Subtotal (A, B, C, D, E, F, G, H) <sup>1</sup>		960.0	23.9	N.A.	100.0	91,300	27,200	88,500	207,000	53.5	158,270	58.5	
3. Industrial													
		1,180.0	29.5	N.A.	N.A.	38,100	8,200	8,200	54,500	14.1	44,150	16.3	
4. Residential													
		1,670.0	41.8	N.A.	N.A.	45,300	11,500	19,700	76,500	19.7	28,760	10.5	
TOTAL		4,000.0	100.0	N.A.	N.A.	213,800	56,500	118,900	387,200	100.0	270,900	100.0	

<sup>1</sup>Fringe #2 not included.  
N.A. — Not Available.

SOURCE: Transportation Plan for Los Angeles Central City Area, Report No. 1, Department of Traffic, and Downtown Business Men's Association, June 27, 1962.

<sup>1</sup>Fringe #2 not included.  
N.A. — Not Available.

SOURCE: *Transportation Plan for Los Angeles Central City Area*, Report No. 1, Department of Traffic, and Downtown Business Men's Association, June 27, 1962.

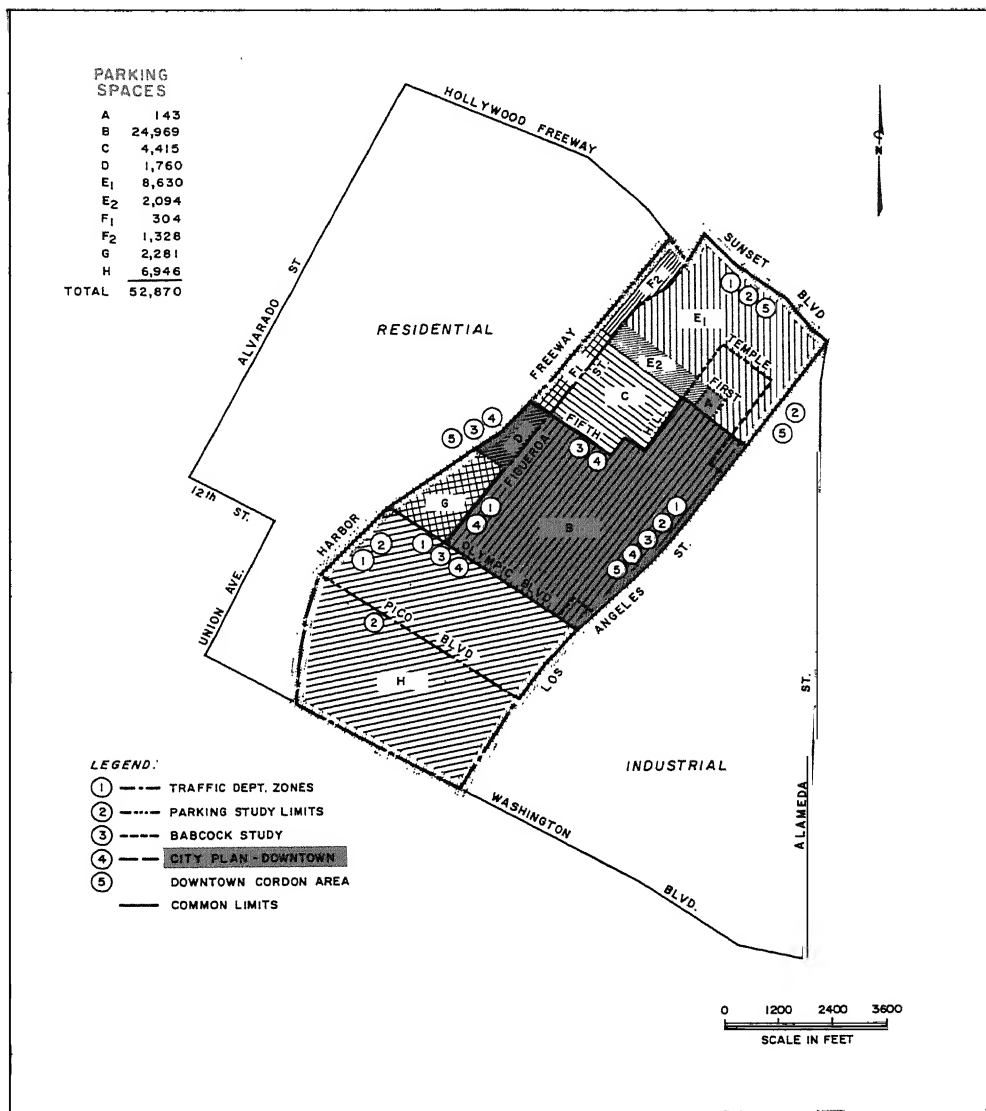


FIGURE 26

### CENTRAL CITY AREA — LOS ANGELES, CALIFORNIA

The 6.4 square mile "Central City Area" is generally bounded by Alameda Street on the east, Washington Boulevard on the south, Alvarado and Union Streets on the west and the Hollywood Freeway on the north.

The "Downtown Sector" (as defined by the Traffic Department) includes the 470-acre area bordered by Figueroa Street on the west, Olympic Boulevard on the south, Los Angeles Street on the east, and Second Street on the north. Downtown as defined by the City Planning Department excludes Bunker Hill; this 400-acre area has approximately the same distribution of employment, parking, and trip destinations as the "Downtown Sector." The Civic Center, fringe, industrial, and residential areas surround the downtown sector.

Total downtown net rentable floor space and ground area (1960) approximates 40 million square feet, exclusive of streets and alleys.<sup>46</sup> Approximately 30 per cent of this space is devoted to offices. Retail establishments occupy about 14 per cent, and hotels, motels, and rooming houses about 13 per cent. Approximately six per cent is devoted to parking in interior buildings, and nine per cent open lot parking. Thus, parking occupies about 15 per cent of the total floor space — more than either hotel or retail uses.

### Economic and Historical Development Influences

Existing central business district land-use patterns are no accident. They are an outgrowth of a series of associated economic and historical antecedents

<sup>46</sup>A detailed discussion of land use and related CBD characteristics is contained in *Los Angeles Centropolis, 1980-Volume I, Economic Survey*, a Joint Report by the Los Angeles Central City Committee and Los Angeles City Planning Department, 1962.

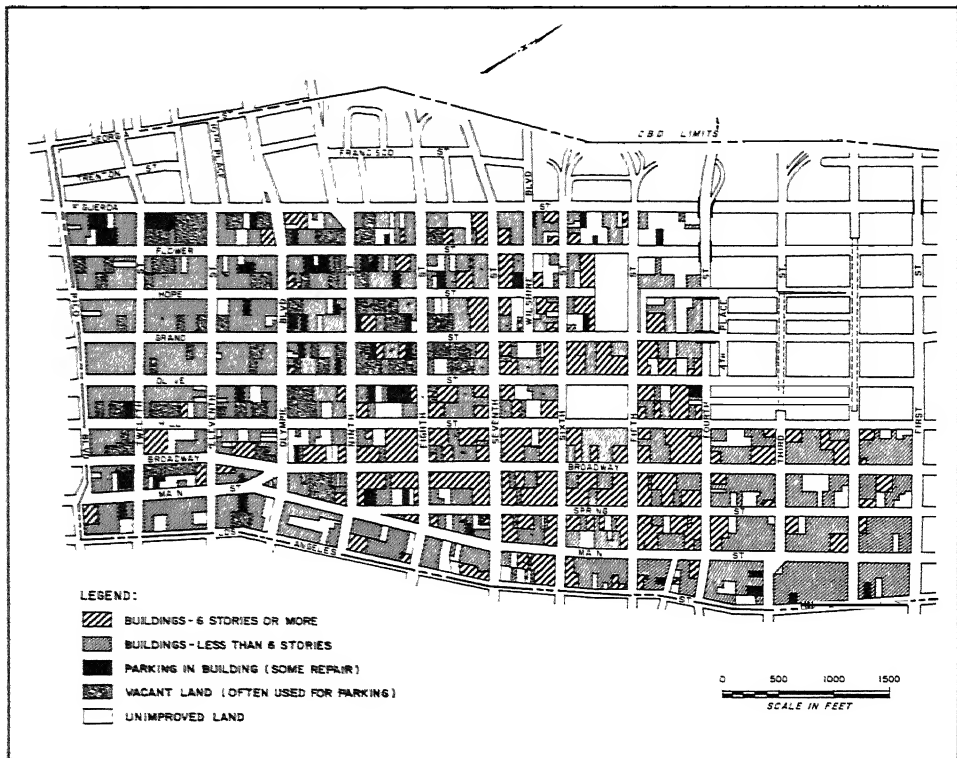


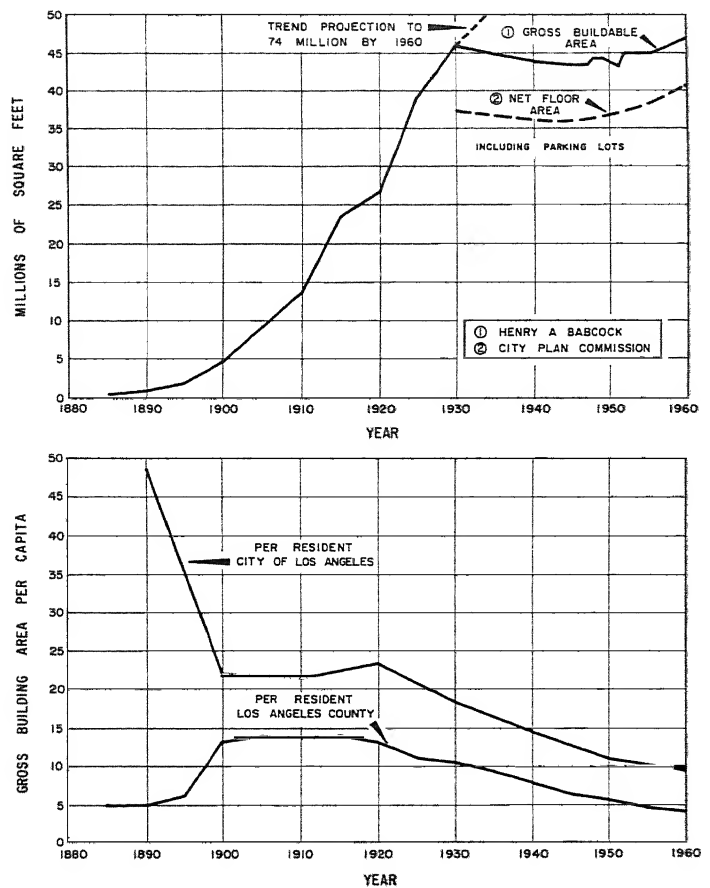
FIGURE 27  
LAND DEVELOPMENT IN  
LOS ANGELES CENTRAL BUSINESS DISTRICT, 1930

Vacant land was common in downtown Los Angeles by 1930. Many parcels were not occupied by buildings due to (1) surplus land available elsewhere, (2) zoning actions which permitted excess commercial land, (3) apparent assessment of downtown properties out of proportion to earnings, and (4) multiple land ownership. Source: C. Reeves and Los Angeles Bureau of Municipal Research, *The Valuation of Business Lots in Downtown Los Angeles*, 1931.

FIGURE 28

# TRENDS IN LAND DEVELOPMENT DOWNTOWN LOS ANGELES

Trends in gross building area lucidly portray the stabilization of downtown Los Angeles. Gross building area increased between 1895 and 1930, then remained relatively constant to about 1950; since 1950, it has increased gradually. Expressed on a per capita basis, gross building area shows that prior to 1920 downtown expanded proportionally to increases in city (or county) population. Since 1920, increases in downtown have *not* been proportional with over-all population growth. Source: H. A. Babcock, *Report of the Economic Phases of the Bunker Hill Renewal Project*, 1956.



and reflect a cumulative interplay among dynamic growth factors, public policy decisions, and technological innovations.

**Changes in Location of Activity** — Downtown's focus, partially in response to the westward shift of the city's population, has gravitated southerly and westerly over the past 30 years. Peak land values are currently found at the Broadway-Seventh intersection.

**Floor Space** — Trends in net floor space, by type of use, are shown in Table 20. Between 1930 and 1960, there was a 2.1 per cent increase in net floor area — 9.7 per cent when surface parking is included. Floor space devoted to hotel, institutional, manufacturing, wholesale, retail, and service purposes declined, while government, quasi-public, office, and parking uses increased.

As shown in Table 21, downtown floor and ground space devoted to off-street parking increased from 7.6 per cent in 1930 to 12.3 per cent in 1955 and to 14.7 per cent in 1960. Nearly one fifth of the 3.7 million square feet of net floor area added since 1930 was within parking structures.

**Retail Sales** — CBD retail sales decreased from \$451 million in 1948 to \$421 million in 1954, and further declined to \$400 million in 1958, while total sales within the city increased from \$2.3 billion in 1948 to \$3.1 billion in 1954 and to \$4.3 billion in 1960.



TABLE 20  
NET FLOOR AREA CHANGE BY USE CATEGORY  
LOS ANGELES CENTRAL BUSINESS DISTRICT<sup>1</sup>  
Selected Years, 1930-1980

USE	F L O O R   S P A C E					
	1930	1955 — (sq. area foot) —	1960	Change 1930-1960 (sq. ft.)	(per cent)	1980-1980 Expected Change (sq. ft.) (per cent)
Government and Quasi Public.....	1,931,548	2,580,747	3,451,350	1,519,802	78.7	4,000,000 + 548,650 +15.9
Hotel.....	6,120,446	5,600,769	5,389,317	— 731,129	-11.9	7,080,000 + 1,690,683 +31.4
Institutional.....	2,350,438	2,141,471	2,070,079	— 280,359	-11.9	3,658,000 + 1,587,921 +76.7
Manufacturing and Wholesale.....	3,560,564	3,239,660	3,175,655	— 384,909	-10.8	2,500,000 — 675,655 -21.3
Office.....	10,844,594	11,421,176	12,424,067	1,579,473	14.6	24,145,000 + 11,720,933 +94.3
Parking Inside <sup>2</sup> .....	1,582,473	1,812,014	2,227,129	644,656	40.7	5,500,000 + 3,272,871 +147.0
Retail.....	6,539,336	5,985,136	5,504,283	-1,035,053	-15.8	5,917,000 + 412,717 + 7.5
Service.....	2,676,241	2,470,928	2,449,775	— 226,466	- 8.4	4,366,000 + 1,916,225 +78.2
TOTAL NET FLOOR AREA.....	35,605,640	35,251,901	36,691,655	1,086,015	3.1	57,166,000 + 20,474,345 +55.8
Surface Parking.....	1,233,398	2,910,204	3,737,071	2,503,673	203.0	1,400,000 — 2,337,071 -62.5
GRAND TOTAL-NET FLOOR AREA AND GROUND AREA.....	36,839,038	38,162,105	40,428,726	3,589,688	9.7	58,566,000 + 18,137,274 +44.9

<sup>1</sup>Boundaries as established for a land-use survey completed by the Los Angeles City Planning Department in January, 1960.

<sup>2</sup>Inside parking includes parking structures and space provided within a building as an accessory to another use.

SOURCE: *Los Angeles Centropolis 1980* (Vol. 1) *Economic Survey*, A Joint Report by the Los Angeles Central City Committee and the Los Angeles City Planning Department, 1962.

TABLE 21  
PERCENTAGE OF LOS ANGELES CBD  
FLOOR SPACE DEVOTED TO PARKING

TYPE OF PARKING	YEAR		
	1930	1955	1960
Parking Structures.....	4.3	4.7	5.5
Open Lot (Surface) Parking.....	3.3	7.6	9.2
TOTAL.....	7.6	12.3	14.7

Note: Includes open parking lots, but excludes street space.

SOURCE: Adopted from Table 11, *Los Angeles Centropolis — 1980 Economic Survey, Volume I* — A Joint Report by the Los Angeles Central City Committee and the Los Angeles City Planning Department, 1962.

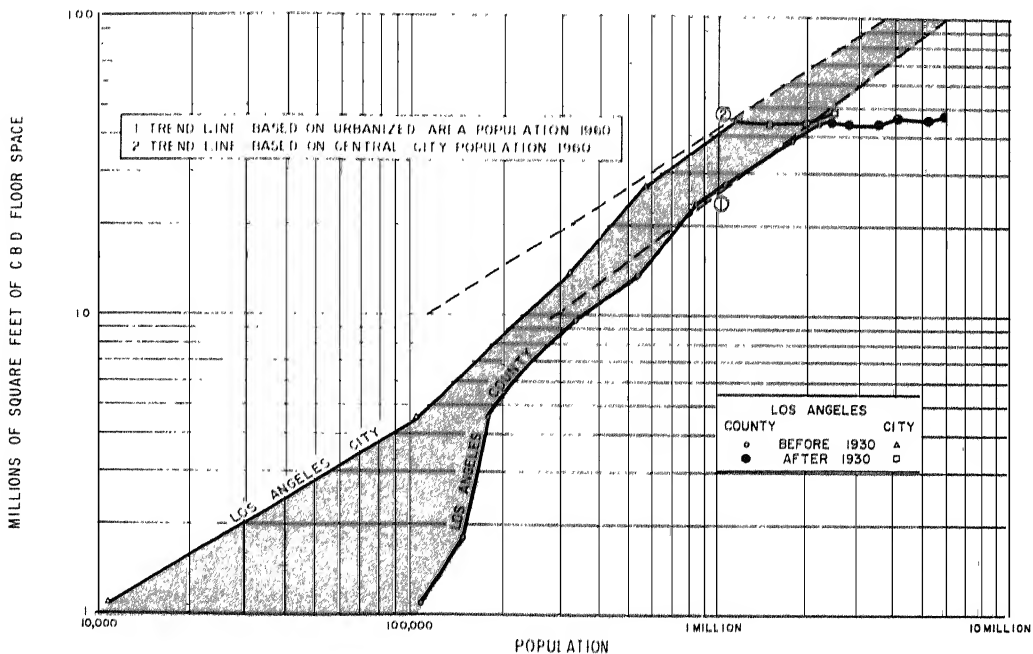


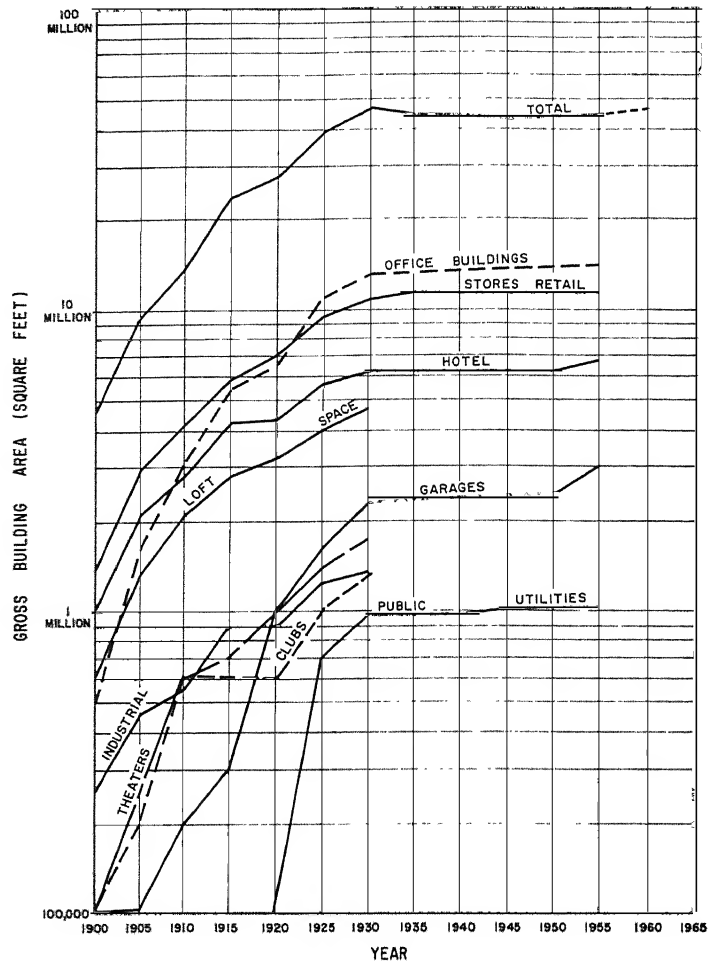
FIGURE 29  
LOS ANGELES CENTRAL BUSINESS DISTRICT BUILDING AREA  
IN RELATION TO POPULATION

Prior to 1930, downtown Los Angeles was apparently similar to downtowns in other cities of comparable size. Its gross floor area (1920-30) in relation to urban population was generally consistent with that found in other urban areas in 1960.

FIGURE 30

TRENDS IN GROSS BUILDING  
AREA BY TYPE OF SPACE  
LOS ANGELES CENTRAL  
BUSINESS DISTRICT,  
1900-1955

This chart shows the relative increases in the various types of downtown building space. Note how almost every category of land use has remained about the same since 1930. Source: H. A. Babcock, *Report of the Economic Phases of the Bunker Hill Renewal Project*, 1956.



Downtown department store sales totaled \$107 billion in 1929 as compared with \$125 billion in 1959, 75 and 18 per cent respectively of the metropolitan area total.

**Assessment Policies** — Trends in assessed valuation of CBD land and buildings, Table 22, show a 69 per cent decline between 1931-32, and 1959-60. Within the 20-year period, 1941-42 and 1959-60, assessed land value declined from \$72 to \$63 million, compared with a rise in improvement valuations from \$48 to \$85 million as expressed in current dollars.

**Demolition of Obsolete Buildings** — In the early 1930's, demolition increased as numerous buildings became empty and unprofitable to maintain, and continued despite subsequent reductions in assessments.<sup>47</sup> About 5 million square feet of buildings on approximately 2.2 million square feet of land were demolished between 1930 and 1955; buildings averaged 40 to 50 years in age and were generally of masonry and frame construction. During this period, new

<sup>47</sup>Property tax reductions recommended by the Los Angeles Bureau of Municipal Research, 1932, were implemented over the next three years.

TABLE 22  
 ASSESSED VALUATION OF LAND AND IMPROVEMENTS  
 LOS ANGELES CENTRAL BUSINESS DISTRICT  
 SELECTED YEARS — 1931-1960

<u>FISCAL YEAR</u>	<u>ASSESSED VALUATION (thousands of dollars)</u>			
	<u>Land</u>	<u>Improvements</u>	<u>Total</u>	<u>Dollars Per Capita</u>
1931-32____	\$169,000	\$71,000	\$240,000	\$194
1941-42____	72,100	47,700	119,800	80
1948-49____	83,450	84,750	168,200	85
1959-60____	63,038	85,100	148,138	60
<u>FISCAL YEAR</u>	INDICES 1931-32 = 100			
1931-32____	100	100	100	100
1941-42____	43	67	50	41
1948-49____	49	119	70	44
1959-60____	37	120	62	31

SOURCE: *Los Angeles Centropolis — 1980*, Los Angeles Central City Committee and Los Angeles City Planning Department, 1962.

construction occupied only about four per cent of the cleared land, whereas approximately 60 per cent was converted to open lot parking.

After 1946, building and safety code enforcement was intensified and the number of demolitions increased. Since new buildings often were erected in more desirable locations, land occupied by structures that could not meet rigid building code requirements was commonly converted into parking lots, especially on the periphery of downtown.

### Off-Street Parking Trends and Characteristics

Parking facilities emerged as a result of the prevailing economic climate after World War I (rapid growth, inflated land values, and excessive zoning for commercial use), increased automobile use and subsequent municipal decisions which served to disperse rather than compact CBD land use.<sup>48</sup>

<sup>48</sup>See: C. Reeves and the Los Angeles Bureau of Municipal Research, *The Valuation of Business Lots in Downtown Los Angeles*, 1931, for additional details on land values, assessment policies, and decentralization trends.

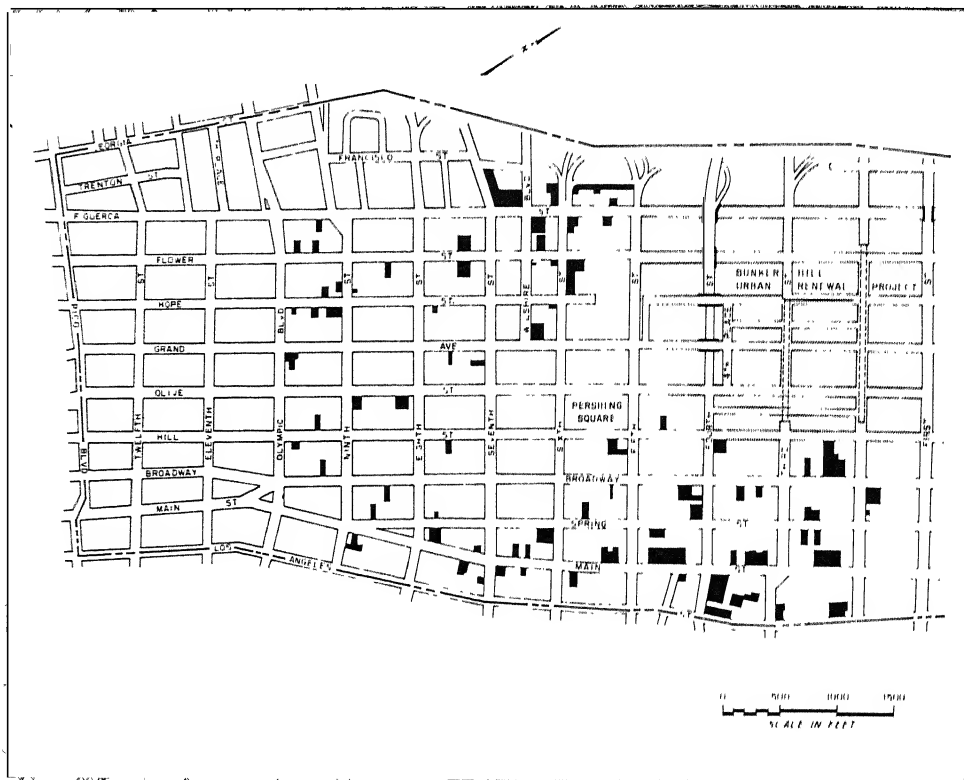


FIGURE 31

#### LOCATION OF DEMOLITIONS

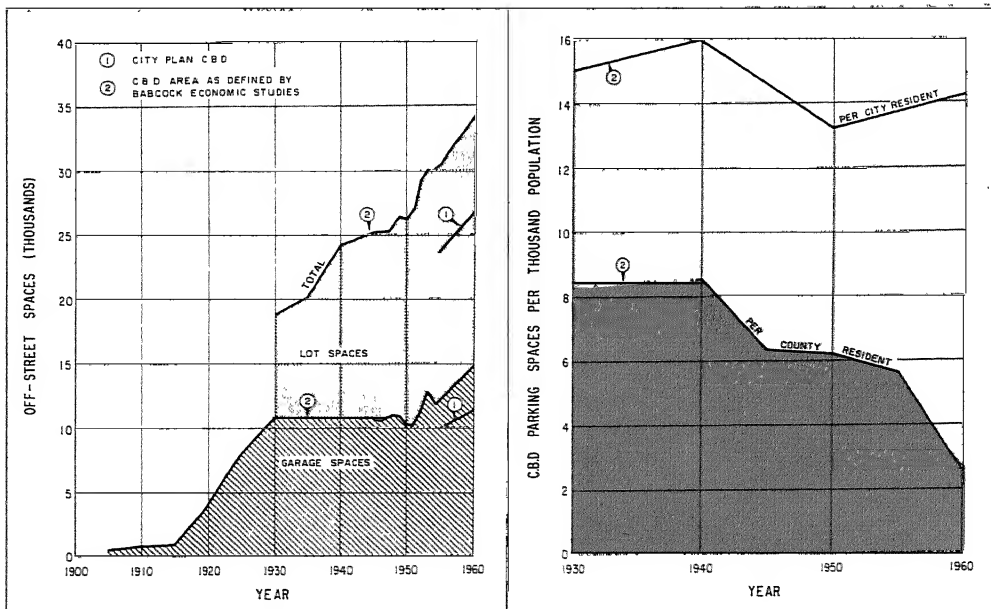
#### LOS ANGELES CENTRAL BUSINESS DISTRICT, 1945-1960

Within this 15-year period, 285 demolitions occurred in the central city area of which 136 — nearly 2,856,000 square feet of floor area — were in the central business district. Cleared sites were generally converted into surface parking lots — buildings demolished averaged 50 years in age. Source: Los Angeles, City Planning Commission.

The 13-story height restriction, a precaution against earthquakes, precluded intensive vertical core area development. The lack of major physical barriers to confine downtown (and thereby encourage concentration), and public works programs (which improved regional highway access) served to “homogenize” urban land and facilitate development of outlying centers.

A 1946 zoning ordinance stipulated the number of parking spaces required in conjunction with new building construction. It was a progressive ordinance, geared toward adapting the central business district to the motor age. In commercial zones, it required one off-street parking space for each 500 feet of floor area — a “parking index” of two.

**Traffic and Parking Magnitudes** — Employment, travel, and parking characteristics of the various central city sectors are summarized in Table 19. Within the area encompassed by Sunset Boulevard, Figueroa Street, Pico Boulevard,



**FIGURE 32**  
**TRENDS IN OFF-STREET PARKING SPACE**  
**LOS ANGELES CENTRAL BUSINESS DISTRICT — 1900-1960**

and Los Angeles Street, there were approximately 53,000 legally defined off-street and 3,000 curb parking spaces in 1961.<sup>49</sup> An additional 3,000 spaces could be achieved by using land not specifically marked as stalls and reservoir areas within parking facilities.

About 35,000 spaces are located within the 470-acre "downtown" sector, which accounts for over 40 per cent of the total central city trip destinations and employment.<sup>50</sup> On an average 1961 weekday, nearly 158,000 person trips were destined to this area. Approximately 55 per cent of the trips were made by transit and 45 per cent by private auto.

**Off-Street Parking, 1956 and 1961** — Recent changes in downtown parking supply are given in Table 23. Since 1956, the number of parking spaces has increased in most blocks. "Downtown" Los Angeles had nearly 53,000 off-street spaces in 657 facilities in 1961, compared with 46,000 spaces in 549 facilities in 1956. Forty-one per cent of 7,149 spaces gained since 1956 were in lots, and 59 per cent in structures; about half resulted from demolition of obsolete buildings.

Despite abundant fringe parking, garages also have been constructed as conveniences to adjoining property, and/or to help meet specific zoning

<sup>49</sup>Source: Department of Traffic, City of Los Angeles.

<sup>50</sup>The 400-acre CBD defined by the Planning Department has approximately 27,000 off-street spaces.

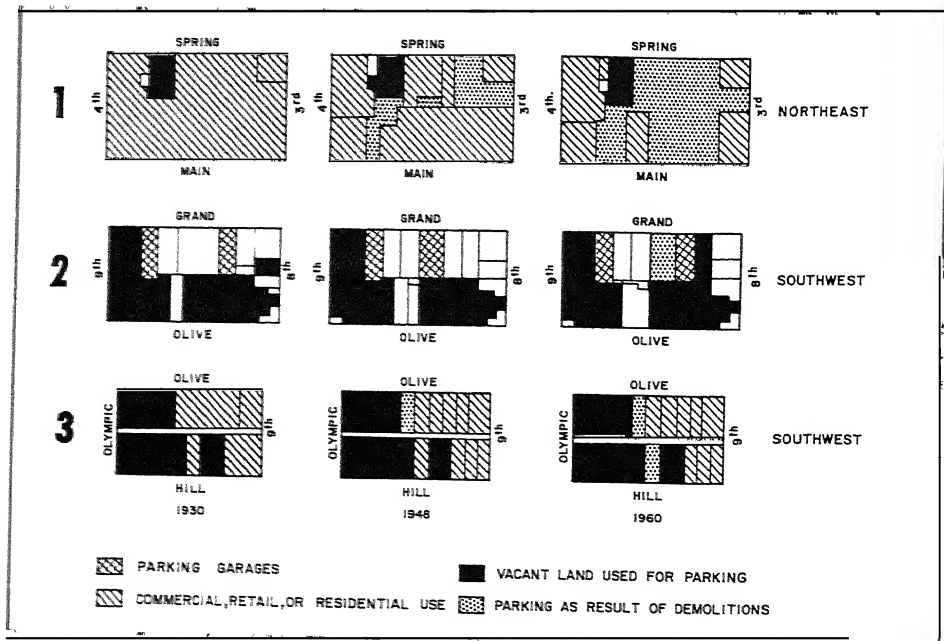


FIGURE 33  
CHANGES IN PARKING AND LAND USE FOR SELECTED BLOCKS  
LOS ANGELES CENTRAL BUSINESS DISTRICT  
1930-1948-1960

- (1) Land-use changes in the block bounded by Third, Main, Fourth, and Spring Streets appear to reflect downtown's southward extension. In 1930, office land uses predominated with parking facilities occupying only one parcel of land; by 1948, parking consumed about 30 per cent of the total land, and by 1960, 56 per cent.
- (2) Vacant land in the block bounded by Grand Avenue and Eighth, Olive, and Ninth Streets has been used continually for parking; since 1948, one building has been demolished and land converted to parking.
- (3) Most parking in the block bounded by Olympic Boulevard, Olive, Ninth, and Hill Streets was developed by 1930; in subsequent years, two buildings were demolished and land converted to parking.

requirements. Major new buildings, existing and under construction, provide parking adjacent to or as an integral part of the development. As shown in Figure 34, most garages constructed since 1955 are located around the perimeter of the core.

Block-by-block changes in CBD parking space supply shown in Figure 35 clearly reflect the effects of land costs. There has been a notable rise in parking activity with increasing distance from the point of highest valuation (Broadway-Seventh Street).

**Spatial Patterns of Parking Supply** — To further pinpoint these variations, the 400-acre central business district was divided into "core," "frame," and "fringe" areas. The 20 blocks with highest assessed values were defined as the core, the next 20 blocks as the frame, and the remaining blocks as the fringe.

TABLE 23  
OFF-STREET PARKING SPACES DOWNTOWN LOS ANGELES  
1956-1961

LOCATION	1956		1961		CHANGE	
	Facilities	Spaces	Facilities	Spaces	Facilities	Spaces
CENTRAL BUSINESS DISTRICT (A, B, D)						
Lot.....	203	13,535	239	15,524	36	1,989
Garage.....	61	10,307	66	11,348	5	1,041
TOTAL.....	264	23,842	305	26,872	41	3,030
BUNKER HILL (C, E <sub>2</sub> , F <sub>2</sub> )						
Lot.....	56	4,119	75	5,078	19	959
Garage.....	19	1,419	22	2,759	3	1,340
TOTAL.....	75	5,538	97	7,837	22	2,299
CIVIC CENTER (E <sub>1</sub> , F <sub>1</sub> )						
Lot.....	48	6,631	45	5,255	-3 <sup>1</sup>	-1,376
Garage.....	29	2,058	32	3,762	3	1,704
TOTAL.....	77	8,689	77	9,017	0	328
FRINGE AREAS (G, H)						
Lot.....	87	6,112	130	7,478	43	1,366
Garage.....	46	1,540	48	1,666	2	126
TOTAL.....	133	7,652	178	9,144	45	1,492
DOWNTOWN TOTAL						
Lot.....	394	30,397	489	33,335	95	2,938
Garage.....	155	15,324	168	19,535	13	4,211
TOTAL.....	549	45,721	657	52,870	108	7,149

<sup>1</sup>Estimated.

Note: Areas categorized as defined by City Planning Commission; letters designate locations shown in Figure 26.

SOURCE: Downtown parking inventories, 1957 and 1961.

The off-street parking supply and total land area devoted to parking in each of the three subareas are shown in Table 24. Approximately 24 per cent of all off-street spaces (including the 1,640-space Pershing Square Garage) are located in the core which focuses on the Broadway-Seventh intersection; 38 per cent is in the fringe; and 38 per cent is located in the fringe.



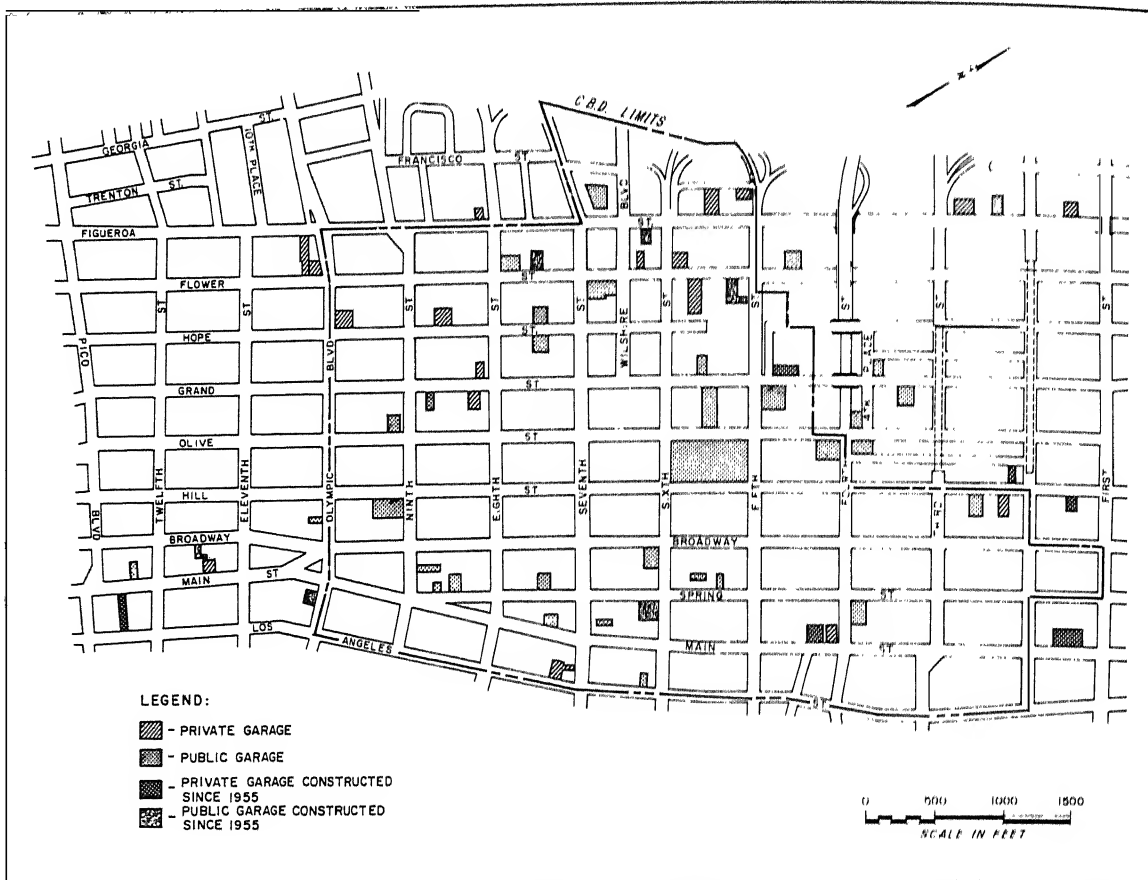


FIGURE 34  
PARKING GARAGES — DOWNTOWN LOS ANGELES, 1962

TABLE 24  
LAND AREAS OCCUPIED BY OFF-STREET PARKING  
MAJOR SUBAREAS, LOS ANGELES CENTRAL  
BUSINESS DISTRICT, 1961

AREA	NUMBER OF BLOCKS	Off-Street Spaces in CBD	APPROXIMATE PER CENT OF Buildable Area Devoted to Off-Street Parking	
			Range <sup>1</sup>	Average
Core.....	20	24	12-34	22
Frame.....	20	38	39-54	43
Fringe.....	25	38	34-52	42
Total.....	65	100		

<sup>1</sup>Range of five-consecutive-block averages.

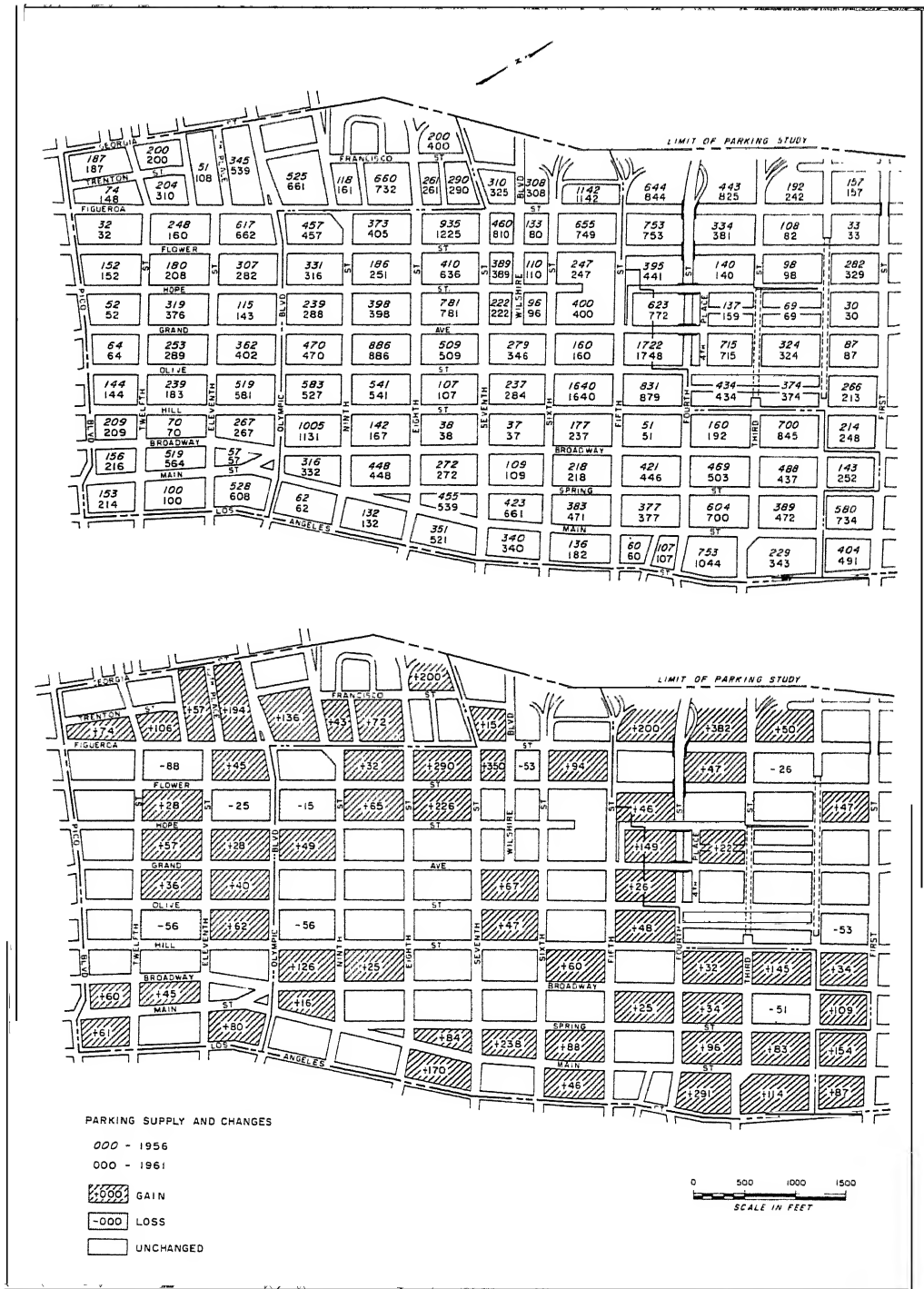


FIGURE 35

CHANGES IN CENTRAL BUSINESS DISTRICT PARKING SUPPLY BY BLOCK  
 1956-1961

Within the core, 32 per cent of all buildable area is devoted to off-street parking. However, parking occupies only about 12 per cent of the land in the five highest assessed blocks; and these blocks contain only about two per cent of the total CBD parking supply. Slightly over 40 per cent of all land in the fringe and frame areas is devoted to parking, with wide variations between individual blocks. Thus, the effects of land costs and scarcity in the "core" is evident.

**Parking Rates** — As would be expected, parking rates are highest where land values are greatest and the parking supply most limited (Figure 36).<sup>51</sup> However, because downtown land values are generally lower than those in other large cities, open lot parking predominates.

Hourly parking rates in the core average 70 cents, while daily rates range

<sup>51</sup>Downtown land is assessed according to location, use, and potential demands. Land between two office buildings, for example, would be assessed at approximately the same value as land on which the buildings are situated, since the vacant land has the same potential for development. Thus, a parking lot between or in proximity to an area of high-use intensity would be assessed accordingly.

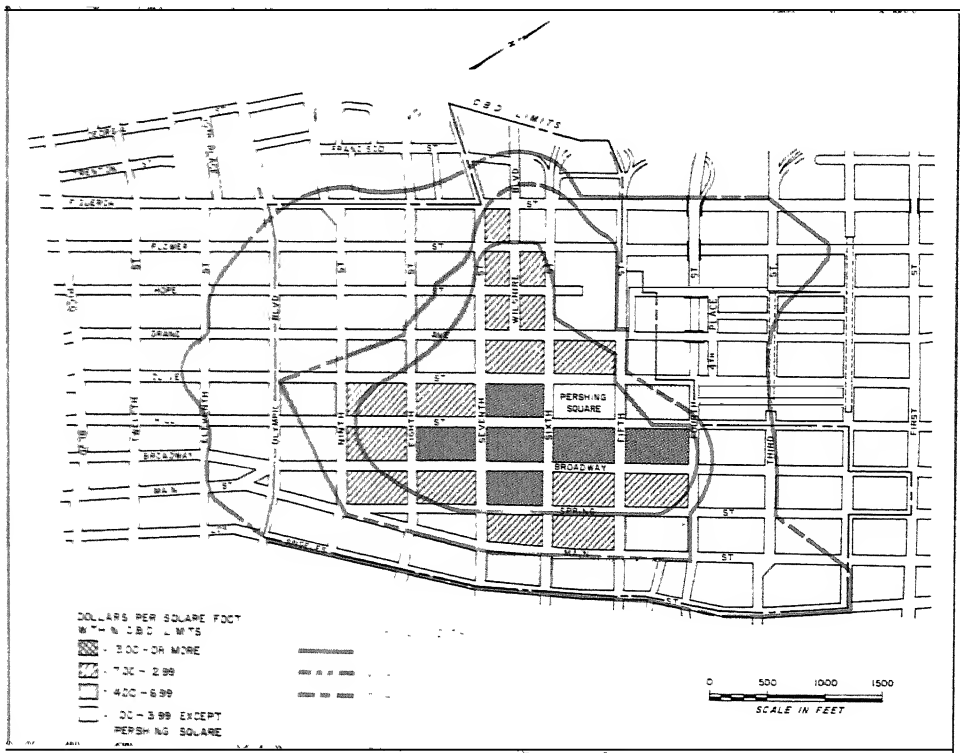


FIGURE 36

HOURLY PARKING RATES AND ASSESSED LAND VALUATION  
LOS ANGELES CENTRAL BUSINESS DISTRICT  
1960-1961

from \$1.25 to \$2.00. Most posted charges are based on half-hour intervals (for example, 35 cents for first half hour). Turnover averages three to five vehicles per space per day.

Parking rates in the frame average 50 cents per hour with maximum all-day parking charges of \$1.00 to \$1.25. All-day parking is common, and daily turnover is generally less than three cars per space.

Most fringe parkers work in nearby offices or merchandising establishments. Hourly rates average 40 cents, while a maximum of 75 cents is common for all-day parking. Daily turnover averages 1.0 to 1.4 cars per space.

**Parking Space Needs** — Space-hours of use and demand in the various downtown subareas are compared in Figure 37.<sup>52</sup> As in other cities, the core has substantial deficiencies, although total CBD space-hours of use equal demand. The over-all surplus results largely from the large number of space-hours available in fringe areas and Bunker Hill.

<sup>52</sup>Source: *A Study of Public Transportation Needs in the Area Served by the Los Angeles Metropolitan Transit Authority, Part I, Origin-Destination Surveys, Volume 2, Exhibits*, Coverdale and Colpitts, New York, N. Y., February, 1959. Areawide, space-hours of use provide a good balance with space-hours of demand. The differences in individual sectors between use and demand reflect needs or surpluses.

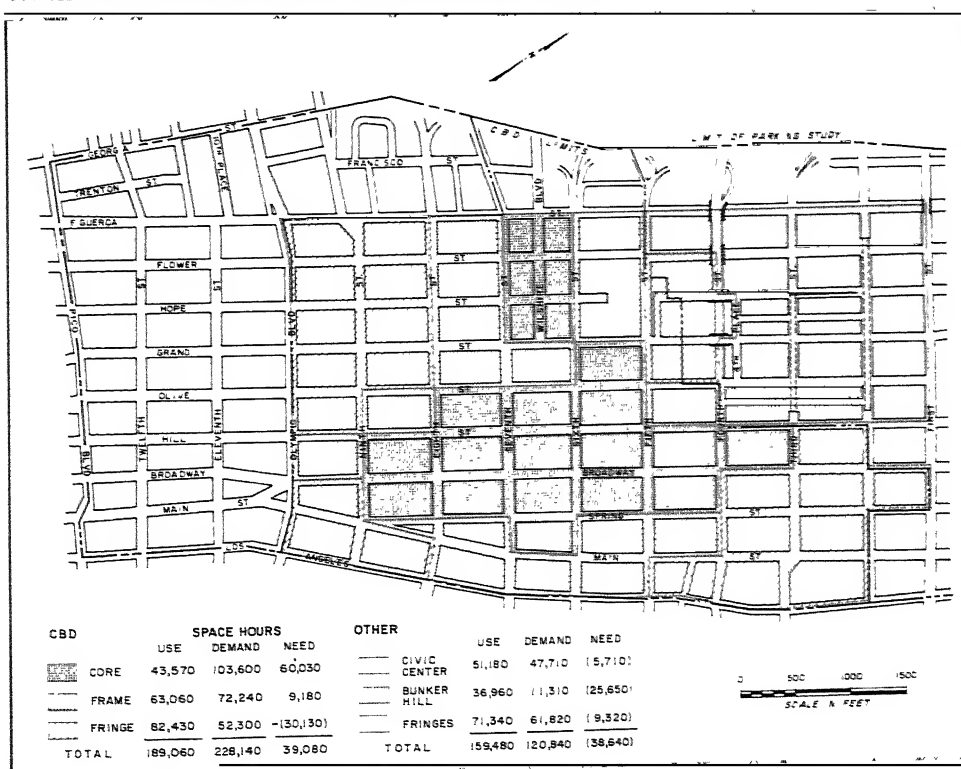


FIGURE 37  
PARKING USE-DEMANDS-NEEDS  
DOWNTOWN LOS ANGELES, 1957

## **Parking As An Economic Use of Downtown Land**

Parking's contribution to the economy of the CBD depends on many considerations. These include its profitability as a business venture, the return it yields to private property owners, and — when viewed in larger context as a supporting service — the extent to which it benefits the over-all community.

**The Parking Lot Operator** — As in many other cities, parking is big business in Los Angeles, and a few parking operators own and/or manage about half of all spaces. Annual income of outdoor parking lot operations, 1961-1962, approximated \$21 million, as compared with \$18 million in 1956. Parking aggregates \$15 million annually within downtown Los Angeles — the equivalent of about 12 per cent of annual downtown department store sales.

The financial returns of parking facilities vary widely according to location, and frequently are comparable to those from other land uses. Illustrative calculations for a 185-space parking lot leased from the city and located about eight blocks north of the Broadway-Seventh intersection clearly demonstrate parking's profitability. The gross monthly income (1961-62) before operating expenses approached \$14,000. Revenues after rent was paid, but before operating expenses, approximated \$4,425 — \$24 per space. (The lease calls for month-to-month operation at a minimum monthly rental of \$4,500 plus 72 per cent of all gross monthly receipts exceeding \$7,000. Parking rates in 1962 were 50 cents per hour and \$1.25 for all day. The lot reported a turnover of five vehicles, and it is utilized for about seven hours each weekday.)

**Retail Business Establishments** — The value of downtown parking to retail business establishments is apparent from the validation plans in which all major department stores participate. Validation agreements permit parking lot operators to receive a set fee from the merchants for each parker who purchases a given amount of merchandise. An hour of free parking is generally provided for a minimum purchase, usually \$2.00.

Some establishments provide parking for customers as a necessary adjunct to services rendered, while others operate lots near retail and financial buildings on a fee basis. One department store (Robinson's) constructed a multideck parking structure on the site of an adjacent parking lot. The increased parking capacity was considered necessary to achieve maximum productivity from the existing store.

**Benefits to the City** — Establishing the value of parking to the city is more complex. There are both positive and negative aspects.

At first glance, it would appear that demolition of buildings to permit parking developments has diminished revenues. But losses in revenues resulting from such demolitions do not necessarily equal the assessed valuations of improvements removed. Where buildings or land were vacant, the city was often unable to collect taxes; in some cases it acquired property for non-payment, cleared the land, and sold or used it for parking. Thus, obsolescence

and uneconomic utilization of land were mainly responsible for losses in tax revenues — not parking, per se.

In view of its basic service functions, parking is not a replacement for active retail outlets, department stores, office buildings, or hotels. Rather, it constitutes an important secondary downtown land use. Moreover, parking can stabilize, enhance or attract major downtown investments and thereby reinforce downtown's tax base. To illustrate, two new office buildings (1962) are being developed within a few hundred feet of the Pershing Square underground garage. In addition, off-street parking is a major part of the Bunker Hill urban renewal.

The preservation or enhancement of municipal tax revenues can be considered beneficial, providing they represent values that might otherwise be lost and not merely transferred to the CBD from another area. Even here, to the extent that such land values and tax revenues might accrue to another political jurisdiction, the city could profit from the gain within its own borders.

### **Parking and the Future of Downtown**

Virtually all land in the Los Angeles central business district is currently in use either as buildings or for parking. Continued expansion requires that new buildings be constructed either on vacant land or existing parking lots. In each case, parking demands would increase and encourage multideck garage construction, since the alternative would be continued dispersal to surrounding areas. The future form of downtown, therefore, emerges as an equilibrium between the forces encouraging and discouraging downtown concentration.

**Prospects for Intensification** — New construction in the Central City area between 1945 and 1960, Figure 38, emphasizes how downtown Los Angeles is evolving into a regional headquarters and administrative center. Since 1945, approximately 4.3 million square feet of floor area have been added to the central business district and an estimated two million square feet were constructed immediately to the west of the Harbor Freeway. Most construction, however, was peripherally located, again exhibiting the lack of focus endemic to downtown Los Angeles. Downtown is perhaps a focal *area* rather than a focal point.

Modification of the 13-story height restriction in 1958 gave impetus to vertical and more concentrated downtown expansion. Also, several developments planned or under construction suggest that the problems of multiple land ownership have been greatly reduced.<sup>53</sup> Continued enlargement of the Civic Center and urban renewal may also encourage new downtown investment.

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<sup>53</sup>As of mid-1962, these include: "Little Tokyo," a four-block area east of Los Angeles Street to be developed by private businessmen; a new 35-story savings and loan association building under completion in the block bounded by Fifth, Broadway, Sixth, and Hill Streets. Office buildings near Sixth, Olive, Seventh, and Grand to be constructed for various administrative and professional uses; and a textile headquarters planned for the Ninth-Los Angeles Street area.

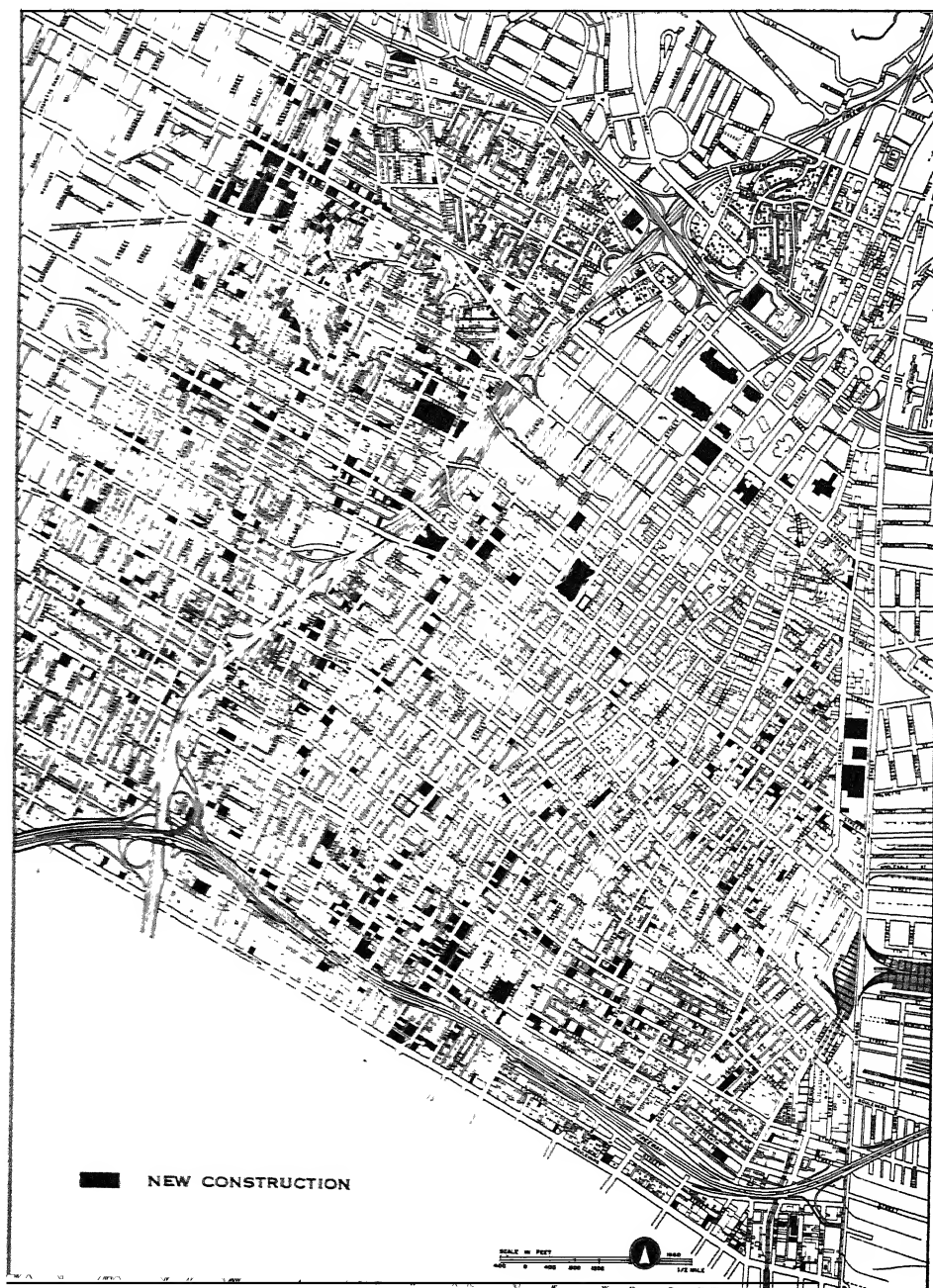


FIGURE 38

NEW CONSTRUCTION 1945-1960  
CENTRAL CITY AREA

Source: Los Angeles City Planning Commission.

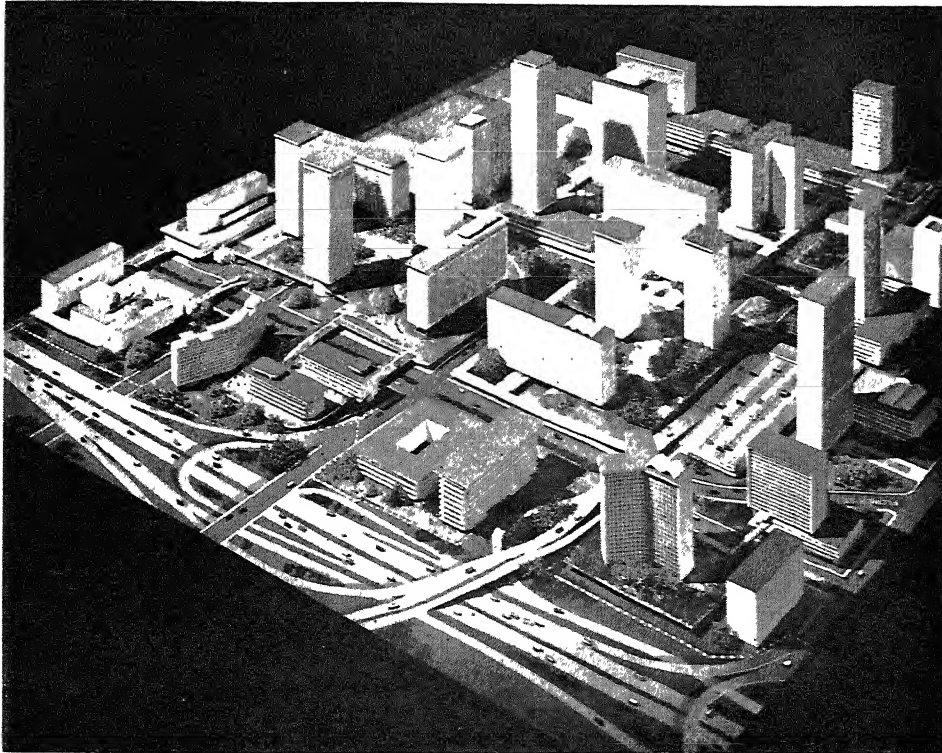


FIGURE 39

SUGGESTED MODEL FOR  
PROPOSED BUNKER HILL URBAN RENEWAL PROJECT

Prepared by Staff of Community Redevelopment Agency — City of Los Angeles.

The Bunker Hill Urban Renewal Project, approved by the City in 1959, will restore a 136-acre area framed by First, Hill, and Fifth Streets and the Harbor Freeway, representing a gross cost of \$65 million upon completion. The project will provide tower apartments for 6,000 to 8,000 persons; office buildings, and related commercial uses for a daytime population up to 50,000 persons; and parking structures to serve the project and surrounding areas. Projected land use include 27.2 acres, residential; 40.4 acres, commercial; 24.1 acres, parking-commercial; and 3.6 acres, public.

The 136-acre Bunker Hill urban renewal project, representing a gross cost of \$65 million, will provide tower apartments for 6,000 to 8,000 persons, office buildings, and commercial uses for a daytime population of 50,000, and related parking structures. By eliminating existing all-day parking spaces that once served the CBD, the project may serve to modify and possibly intensify downtown parking requirements, with consequent increases in all-day parking charges.

**Transportation Planning Implications** — Transportation planning to date has encompassed both highways and transit. However, actual development has been primarily automobile-oriented in an attempt to keep highway construction



ahead of the tremendous increases in demand. Recent completion of the downtown freeway loop, extension of the freeway system, and expansion of downtown off-street parking facilities have improved automotive accessibility to the CBD. But they have not, in themselves, achieved greater downtown intensity. Despite tripling of parking spaces in the past 40 years, the number of people coming downtown remains about the same.

Continued growth of the Los Angeles metropolitan area, perhaps at greater over-all population densities, may further concentrate regional functions within the central business district. As downtown intensifies, open lot parking will gradually diminish while garage construction rises, with some adjustments in all-day parking rates.

With greater downtown intensity, transit demands and potentials will probably also increase. (Currently, transit riders constitute more than half of all "CBD" destinations.) Development of a rail or bus rapid transit system (such as is being planned) focusing directly on the core could also serve to centralize activity. This system might further increase population and employment densities.

## HARTFORD

Hartford is smaller, older, and more densely populated than Los Angeles. The state capital and center of the insurance industry, it has a stable and diversified economy.

### Regional Setting

The central business district serves as the focal point of the Capital Region's half million people, 162,000 of which live within the city's 17 square miles.

Downtown Hartford's position as a major retail center is evidenced by the city's high per capita retail sales, approximately \$2,260, in 1961, as compared with a statewide average of \$1,500. It is compact, has clearly defined centers for both business and office developments, and a relatively high degree of transit usage. In 1959, over 40 per cent of all employees at four major buildings downtown and in its environs rode buses.<sup>54</sup> Approximately 25,000 employees work downtown — about 10 per cent of the metropolitan area's total employment.

Freeways, arterial streets, and an extensive network of bus routes link downtown with all parts of the urban region. The 210-acre central business district, depicted in Figure 40, is limited by physical and cultural features which have restricted its outward spread. Two major buildings — G. Fox and Company Department Store and Travelers Insurance Company — anchor a tightly clustered core. Four department stores located along Main Street are supplemented by men's and women's specialty shops along Pratt and Asylum Streets.

<sup>54</sup>Based on 11,000 employees of the Connecticut Bank and Trust, G. Fox, Travelers Insurance, and Aetna Life Insurance (to the west of downtown).

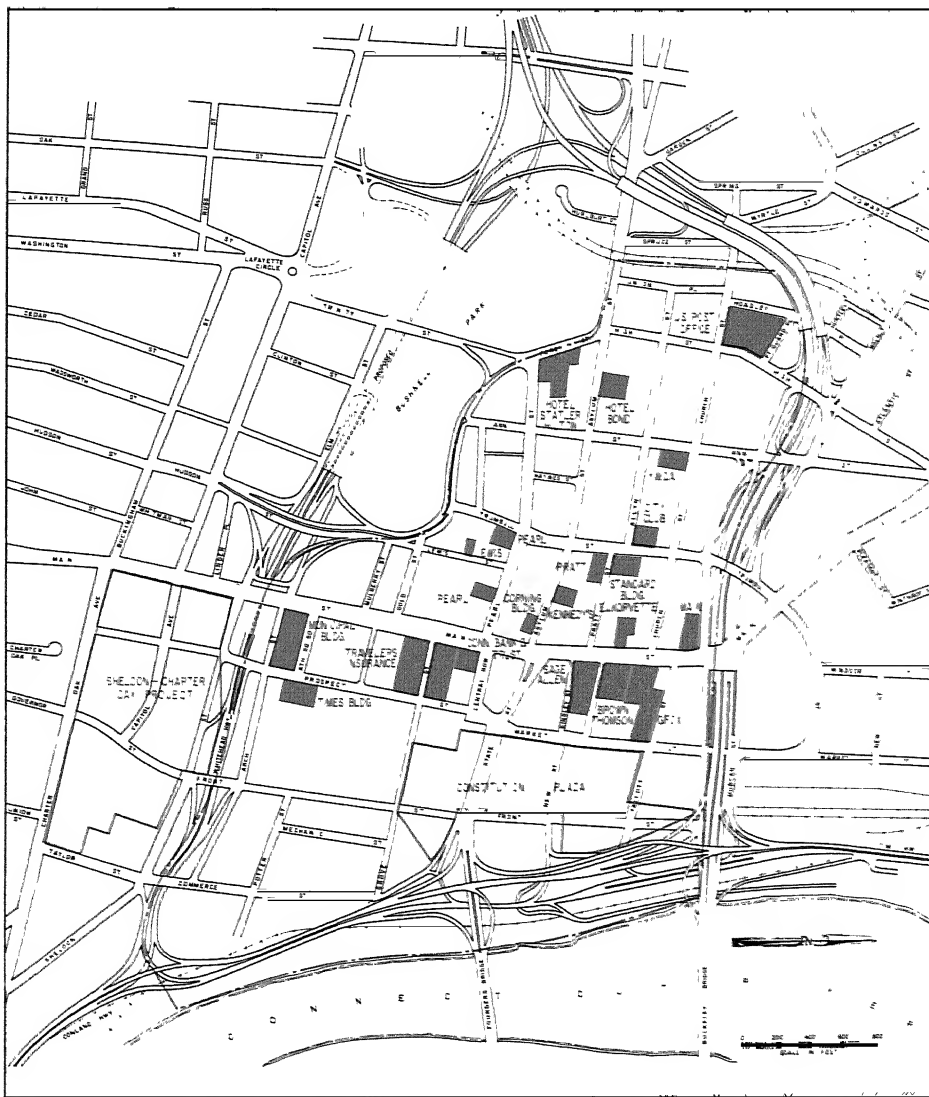


FIGURE 40

### HARTFORD CENTRAL BUSINESS DISTRICT

Downtown Hartford, as outlined above, contains about 210 acres. When Bushnell Park and areas lying between the East-West Expressway and North Main Street are included, it totals over 300 acres of land area.

Total downtown floor space exceeds 15 million square feet. Assessments approximate \$131 million — nearly one fourth of the city's total.<sup>55</sup> As shown in Table 25, nearly half of all CBD assessments result from office or retail land uses.

<sup>55</sup>Assessed city valuation (1958-59) totaled \$601 million — \$3,700 per capita. This constitutes a 46 per cent increase in assessed value per capita from 1949-1950. 1949 assessments approximated \$448 million, \$2,500 per capita.

TABLE 25  
DISTRIBUTION OF LAND USE, FLOOR AREA AND ASSESSMENT  
DOWNTOWN HARTFORD, 1962

<u>LAND USE</u>	<u>PER CENT OF TOTAL</u>		
	<u>First Floor Area<sup>1</sup> 3,935,000 Sq. Ft.</u>	<u>Gross Floor Area<sup>1</sup> 15,833,000 Sq. Ft.</u>	<u>Gross Assessments \$131,510,000</u>
General Office.....	13.1	21.4	27.6
Retail.....	16.1	16.5	23.9
Service.....	34.1	25.9	15.5
Manufacturing.....	3.4	2.9	0.2
Wholesale.....	0.5	0.4	0.3
Utilities.....	3.2	3.2	6.3
Mixed (Commercial & Residential).....	26.7	27.8	22.9
Residential.....	0.8	0.5	0.5
Vacant or Open.....	<u>2.1</u>	<u>1.4</u>	<u>2.8</u>
TOTAL.....	100.0	100.0	100.0

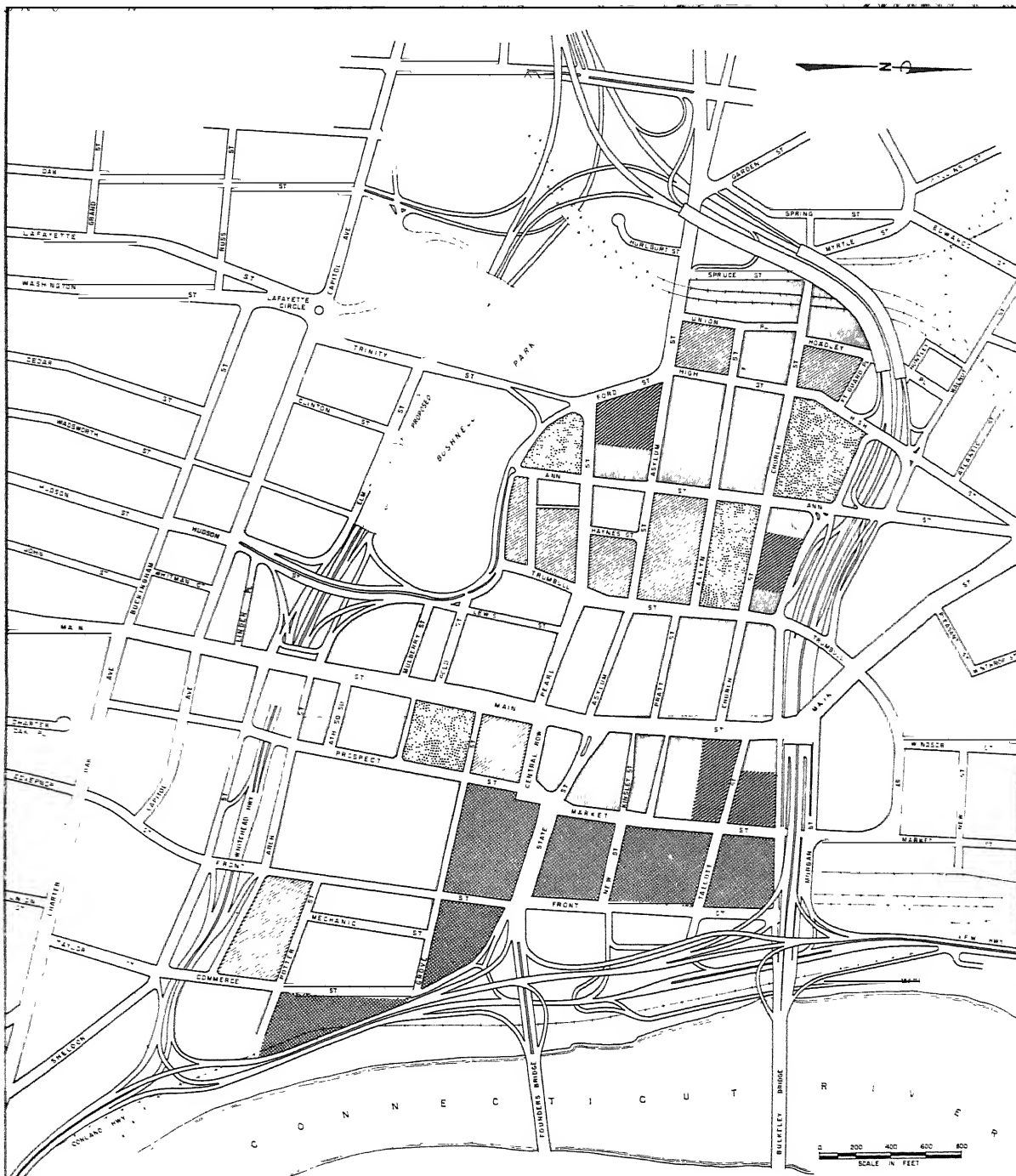
<sup>1</sup>Excludes streets and parking, Bushnell Park, etc.

SOURCE: Commission on the City Plan, Hartford, Conn.

Like many other medium-sized cities, Hartford has experienced physical and economic obsolescence in and around downtown. Current downtown valuations along Main and Asylum Streets are somewhat less than those for 1940. Devaluations have resulted mainly from deterioration of physical structures, decentralization of population and business activity, and variabilities in established assessment procedures. Often, anticipated growth did not materialize.

Between 1959 and 1962, about 60 per cent of all downtown blocks had at least one major change. Of 15 land parcels converted to parking lots in this period, all except two buildings were constructed prior to 1900, and most were in substandard condition. As shown in Figure 41, structures in nearly half of all blocks downtown were built prior to 1913.

Consequently, an extensive redevelopment program is being undertaken to restore downtown's attractiveness and vitality. Recently completed Constitution Plaza exemplifies the city's renewal efforts.



- LEGEND**
- BUILT BEFORE 1913
  - ▒ 1913 TO 1919
  - ▒ 1920 TO 1939
  - ▒ 1940 TO 1949
  - 1950 TO 1964

**FIGURE 41**  
**AGE OF STRUCTURES — CENTRAL BUSINESS DISTRICT**  
**HARTFORD, CONNECTICUT**

## Off-Street Parking Trends and Characteristics

Within recent years, downtown off-street parking has developed in several ways. Parking lots located in fringe areas which were cleared for redevelopment. Lots also emerged where obsolete buildings were demolished and where they provided an interim land use and more profitable rates of return to owners than buildings. Garages were constructed adjacent to specific activity centers — as G. Fox, E. J. Korvette, and Travelers — to provide maximum client, customer, and employee convenience and institutional prestige. More recently, garages became integral parts of redevelopment projects (as Constitution Plaza).

**Parking Trends** — Trends in downtown parking, Figure 42, clearly show how recent space gains did *not* generally increase the proportion of downtown land devoted to parking. They suggest an emerging equilibrium between land devoted to parking and other uses.

Between 1955 and 1963, total downtown parking spaces increased about 35 per cent, from 9,025 to 12,226. Garage spaces more than doubled; lot spaces increased about 10 per cent; and the number of curb spaces declined slightly. In 1963, garages provided 41 per cent of the total downtown supply, compared with 25 per cent in 1955. When facilities under construction (or currently planned) are completed, garages will contain about 45 per cent of the total spaces.

This increase in garage space has resulted mainly from expansion of the G. Fox and Company garage (1960), completion of the E. J. Korvette garage (1961), and opening of the Constitution Plaza garage, 1963. These garage developments as adjuncts to department stores or urban redevelopment are strikingly similar to experiences of other cities.

**Present Space Supply** — Locations of principal off-street parking facilities are depicted in Figure 44. Parking lots proliferate the western part of downtown, whereas garages “penetrate” the core. Approximately one third of all

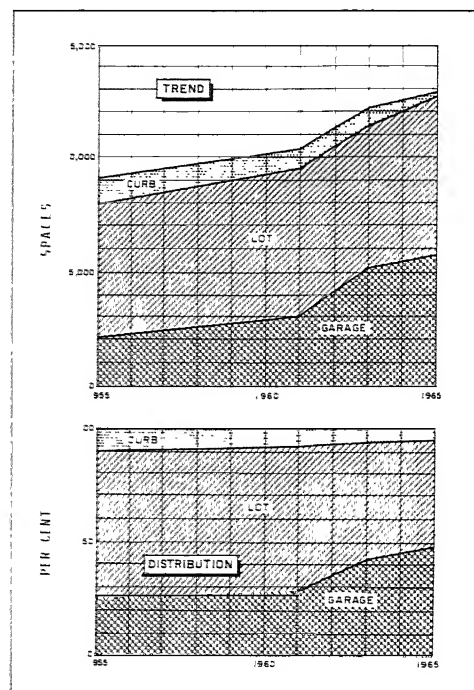


FIGURE 42  
TREND AND DISTRIBUTION OF  
DOWNTOWN PARKING SPACES  
HARTFORD, CONNECTICUT

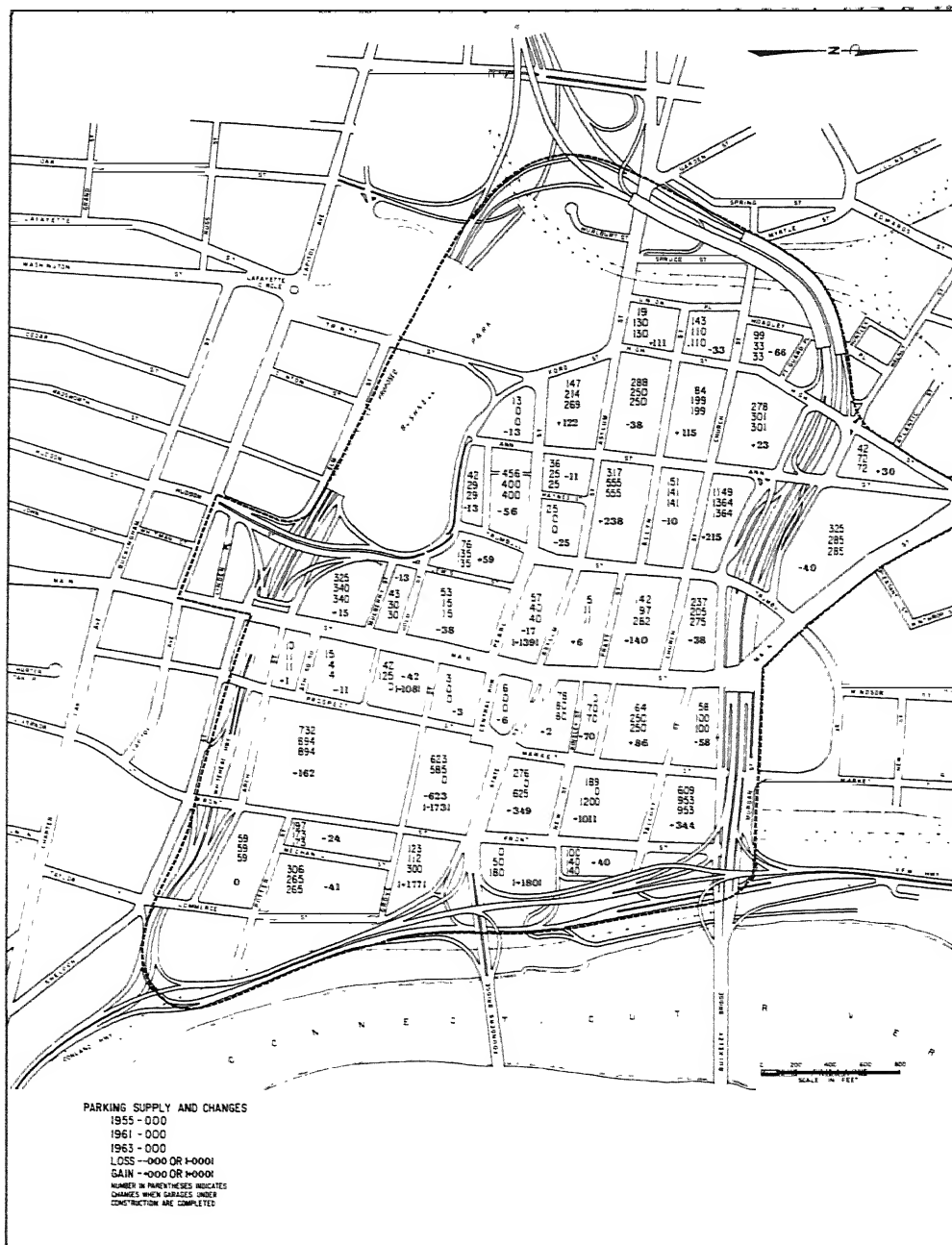


FIGURE 43

### CHANGES IN PARKING SUPPLY — CENTRAL BUSINESS DISTRICT HARTFORD, CONNECTICUT

The block-by-block changes in downtown parking supply show that major increases have resulted from development of core area garages in the core area. In these blocks, in particular, the shift from lot to garage spaces has been accompanied by an intensification of adjacent land uses.



downtown spaces are within 600 feet of Main Street and are located in the G. Fox and Company garage (850 spaces), Constitution Plaza (1,825 spaces), and Phoenix Mutual (under construction, about 450 spaces).

The distribution of parking spaces according to type of facility is shown in Table 26. Nearly 40 per cent were located in public garages, 29 per cent in public lots, 19 per cent in private lots and garages, and 12 per cent in temporary lots or along curbs. Approximately one third of all spaces reflect department stores, redevelopment, or municipal interests (Table 27).

**Parking Rates** — Downtown parking rates correlate with assessed land values. The highest rates — over \$1.50 per day — are in the core near G. Fox and Company and Travelers Insurance, while the lowest daily rates, under \$1.00 per day, are in fringe areas.

Hourly rates range from 25 to 40 cents per hour, with a median fee of about 35 cents. Charges for two hours vary from 35 to 70 cents. Contract monthly parking costs \$10 to \$20 per month depending on location and type of space.

TABLE 26

PARKING SPACES, DOWNTOWN HARTFORD — 1963

TYPE FACILITY	Number of Facilities	1963	Per Cent of Total
		Total Spaces	
Private Lots.....	115	2,133	17.5
Private Garages.....	6 <sup>1</sup>	151 <sup>1</sup>	1.2
Public Lots.....	44	3,598	29.4
Public Garages.....	10	4,875	39.9
Temporary and Other.....	7	696	5.7
Subtotal			
Off-Street.....	182	11,453	93.7
Curb.....	—	773	6.3
TOTAL.....	182	12,226	100.0

<sup>1</sup>Excludes garages under construction: Phoenix, 450; Tower Square, 150; and Hartford National Bank and Trust, 150 spaces (approximately).

SOURCE: *Parking Study of Central Business District, Hartford, Conn.*, Wilbur Smith and Associates, New Haven, Conn., 1961, updated by field investigations, 1963.



TABLE 27  
OWNERSHIP OF PARKING FACILITIES  
DOWNTOWN HARTFORD, 1963

TYPE FACILITY AND OWNERSHIP	APPROXIMATE PER CENT OF TOTAL SPACES
Municipal (Church St. garage, Front Street lot).....	10
Department Store (G. Fox, E. J. Korvette garages).....	9
Constitution Plaza (garages).....	16
Public Off-Street Facilities (privately owned and operated)....	46
Private Off-Street Facilities (restricted usage).....	19
Total.....	100

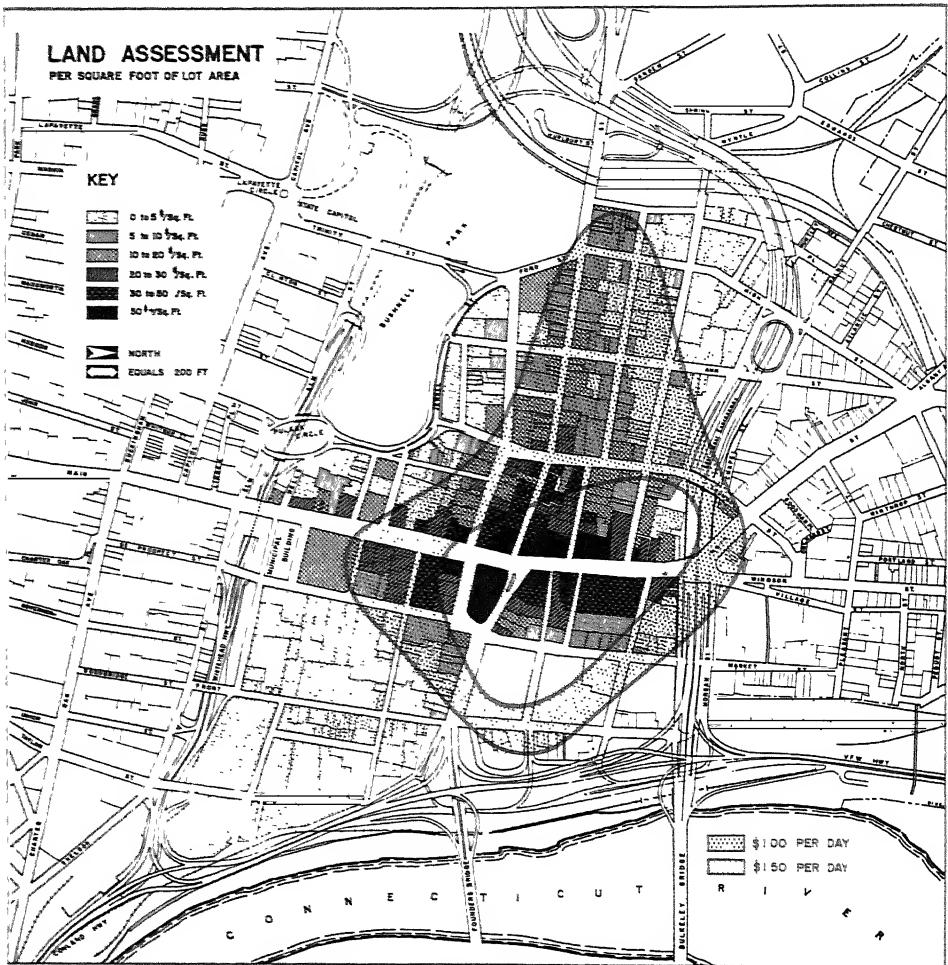


FIGURE 45  
DAILY PARKING RATES AS RELATED TO ASSESSED LAND VALUE  
HARTFORD, CONNECTICUT

**Parking Characteristics** — Characteristics of downtown parkers, summarized in Table 28, are similar to those found in other urban areas, except that the percentage of shoppers is somewhat higher.<sup>56</sup> The typical off-street parker walks 635 feet, stays nearly three hours, and is downtown primarily to work or shop. In contrast, the typical curb parker remains for about one hour, walks slightly less than 500 feet, and is downtown primarily to transact personal business.

**Parking Space Needs** — Downtown parking space deficiencies (excluding Constitution Plaza and the new Phoenix Building) totaled 773 spaces on an average 1961 day and 2,382 on a peak day. Additional space needs were mainly concentrated in the Travelers' and G. Fox blocks, and in the blocks encompassed by Pearl, Trumbull, Main, and Pratt Streets. By 1971, these parking space needs were expected to exceed 4,400 on an average day and 6,600 on a peak day.

<sup>56</sup>Source: *Parking Study of Central Business District, Hartford, Connecticut*, Wilbur Smith and Associates, New Haven, Connecticut, 1961.

TABLE 28  
CHARACTERISTICS OF PARKERS  
HARTFORD CENTRAL BUSINESS DISTRICT, 1961

<u>ITEM</u>	<u>TYPE FACILITY</u>		<u>Total</u>
	<u>Off-Street</u>	<u>Curb</u>	
Average Fee			
One hour.....	\$0.36	— <sup>1</sup>	—
All Day.....	0.81	— <sup>1</sup>	—
Turnover.....	1.2	4.8	1.5
Average Duration (hours).....	2.9	1.1	2.5
Average Walking Distance (feet).....	655	489	631
Per Cent Distribution by Purpose			
Shoppers.....	29.1	18.2	26.5
Business.....	14.6	37.0	20.0
Work.....	36.6	6.2	29.2
Other.....	<u>19.7</u>	<u>38.6</u>	<u>24.3</u>
	100.0	100.0	100.0

<sup>1</sup>Itemization not readily available.

SOURCE: *Parking Study of Central Business District, Hartford, Conn.*, Wilbur Smith and Associates, New Haven, Conn., 1961.

## Economics of Recent Parking Developments

Major parking garages clearly indicate the economics of recent downtown parking developments in terms of their specific feasibility and contribution to downtown's vitality.

Accordingly, capacities and rate schedules for four principal garages are compared in Table 29. Hourly rates range from 25 cents in the Constitution Plaza, G. Fox, and Municipal (Church Street) garages to 40 cents in the Pigeon Hole garage. Daily rates vary from \$1.00 in the Municipal garage to \$1.55 in Constitution Plaza.

Because rates at the G. Fox and Municipal garages are generally comparable, the more strategically located G. Fox garage has become the primary shopper facility. This is evident from the relative usage of the two garages shown in Table 30. Each month the G. Fox garage averages over 30 parkers per space, the Municipal garage less than 18.

**G. Fox and Company Garage** — This garage was constructed in 1953 on land obtained from the city by G. Fox, deeded to the city, and then leased back for 20 years.

The garage was designed for self-parking with an initial capacity of about 625 to 650 cars and subsequently expanded, November, 1960, to an 850 to 875-car capacity. This was the maximum parking capacity that could be provided

TABLE 29  
RATE STRUCTURE IN SELECTED PARKING GARAGES  
DOWNTOWN HARTFORD, 1963

<u>RATE SCHEDULE</u>	<u>FACILITY</u>			
	<u>Constitution Plaza</u> (1,525 spaces)	<u>G. Fox</u> (850 spaces)	<u>Municipal Church St.</u> (1,050 spaces)	<u>Pigeon Hole</u> (165 spaces)
First half hour.....	\$0.15	\$0.15	\$0.15	—
First hour.....	0.25	0.25	0.25	\$0.40
First and second hour.....	0.35	0.35	0.40	0.60
Each addi.....	—	0.15	0.15	—
Each additional half hour.....	0.10	—	—	0.10
All day.....	1.55	1.25	1.00	1.40

SOURCE: *Parking Study of Central Business District, Hartford, Conn.*, Wilbur Smith and Associates, New Haven, Conn., 1961; field studies, 1963.

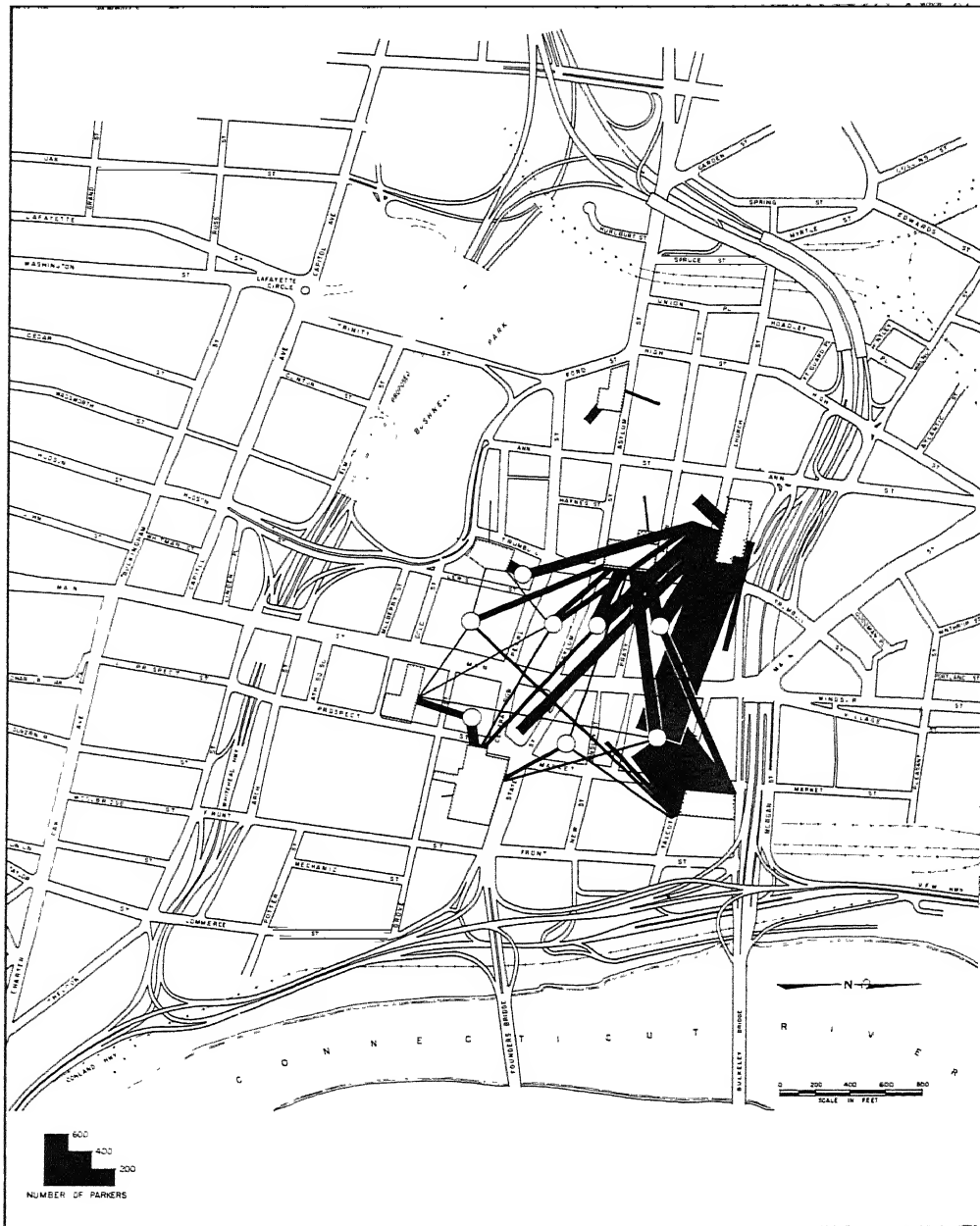


FIGURE 46

INFLUENCE AREAS OF OFF-STREET PARKING FACILITIES  
CENTRAL BUSINESS DISTRICT, HARTFORD, CONNECTICUT

This illustration shows the major off-street facilities in downtown Hartford. Although each facility serves a large area, most primary destinations were in the immediate environs of the facility and usually involved short walking distances. The attractiveness of the G. Fox and Company Department Store is readily apparent.

TABLE 30  
COMPARISON OF G. FOX AND MUNICIPAL GARAGES  
DOWNTOWN HARTFORD

<u>ITEM</u>	<u>MUNICIPAL</u>	<u>G. FOX</u>
Spaces.....	1,050	650
Average Parkers Per Month.....	18,720	21,400
Average Parkers/Space/Month.....	17.8	32.9

SOURCE: *Parking Study of the Central Business District, Hartford, Conn.*, by Wilbur Smith and Associates, New Haven, Conn., 1961.

within the original structure. Construction costs averaged \$1,700 per space; operation is by a firm specializing in parking, and garage hours conform with those of the store.

The growth in daily parkers between 1954 and 1960, Table 31, clearly reflects the garage's rising popularity. During this six-year period, the number of Friday parkers increased 74 per cent; Saturday parkers, 24 per cent.<sup>57</sup> In 1960, average daily parkers exceeded 1,000, while on peak days 2,800 vehicles parked. The average fee per parker approximated 52 cents in 1960 and 44 cents in 1954.

<sup>57</sup>Based on initial capacity of the garage.

TABLE 31  
GROWTH IN DAILY PARKERS  
G. Fox and Company Garage  
DOWNTOWN HARTFORD

<u>DAY</u>	<u>YEAR</u>		<u>INCREASE</u>	
	<u>1954</u>	<u>1960</u>	<u>Number</u>	<u>Per Cent</u>
Average Friday.....	446	776	330	73.9
Average Saturday.....	1,189	1,471	282	23.7

SOURCE: 1954 data from R. A. Burrage, "Customer Self Parking" *Traffic Engineering*, March, 1955; 1960 data obtained from G. Fox and Company for *Parking Study of Central Business District, Hartford, Conn.*, Wilbur Smith and Associates, 1961.

Both in 1954 and 1961, most parkers patronized G. Fox. In 1954, about 85 per cent had destinations at the store; in 1961, 75 per cent. Most other parkers were destined to nearby shopping areas along Main Street.

In 1954, approximately 21 per cent of all shopper-parkers stated they would have shopped elsewhere if it had not been for availability and convenience of the garage.<sup>58</sup> Fifty-four per cent reported they liked downtown shopping because of the wide selection of goods, while another nine per cent liked G. Fox in particular.

The increase in garage capacity, November, 1960, was accompanied by corresponding gains in the number of daily parkers. As shown in Table 32, the increase on peak days was almost directly proportional to the gain in spaces. On an average December, 1959, Thursday, 1,970 parkers used the facility as compared with 2,620 on an average December, 1960, Thursday. Thus, assuming \$15 department store sales per parked vehicle, each additional space contributes nearly \$50 in sales on peak shopping days. The garage expansion, therefore, could reflect up to \$10,000 in additional daily peak pre-Christmas sales.

**Municipal Church Street Garage** — This 1,050-space self-parking garage, completed in 1954, is located on the north side of Church Street between Ann and Trumbull Streets on four or five land parcels, some of which were obtained

<sup>58</sup>R. H. Burrage, "Customer Self Parking," *Traffic Engineering*, March, 1955.

TABLE 32  
EFFECT OF ENLARGING G. FOX PARKING GARAGE  
ON DAILY PARKERS  
DOWNTOWN HARTFORD

<u>ITEM</u>	<u>YEAR</u>		<u>CHANGE</u>
	<u>1959</u>	<u>1960</u>	
Spaces (Approx.).....	625 <sup>1</sup>	850 <sup>2</sup>	225
Average Parkers for Typical December Day			
Thursday.....	1,970	2,620	650
Saturday.....	1,780	2,300	520

<sup>1</sup>Capacity reported in 1961 parking study.

<sup>2</sup>Present capacity is also cited as 875-880.

SOURCE: Based on data compiled for *Parking Study of Central Business District, Hartford, Conn.*, Wilbur Smith and Associates, New Haven, Conn., 1961.

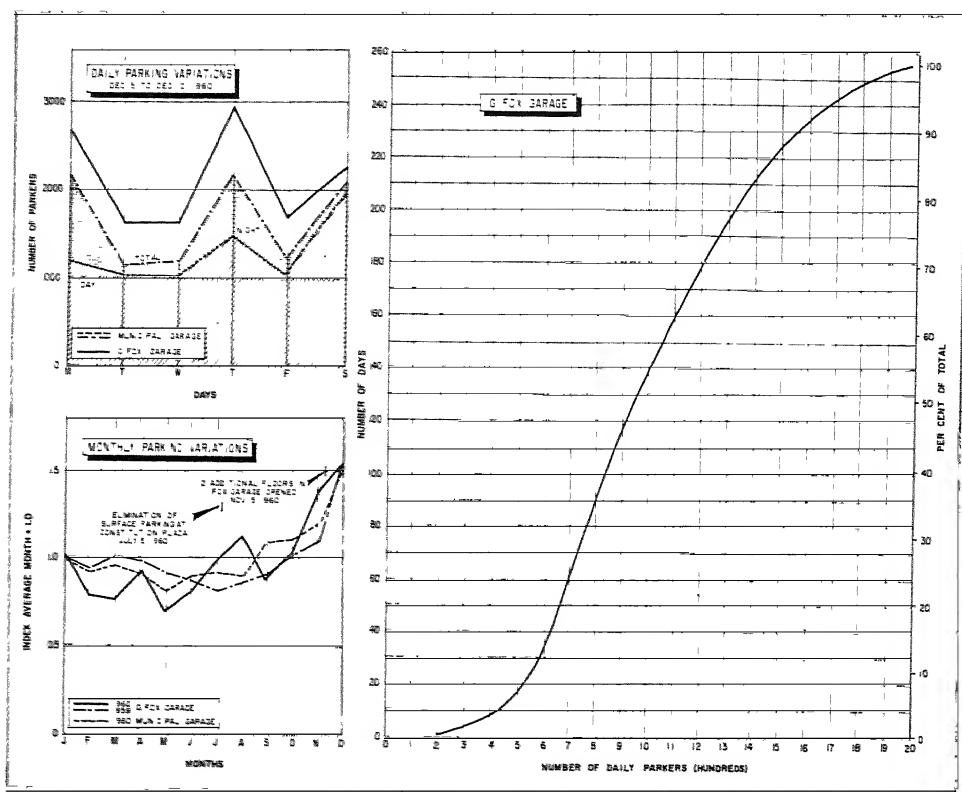


FIGURE 47

#### VARIATIONS IN PARKING GARAGE USE — TWO GARAGES HARTFORD, CONNECTICUT

These variation charts clearly depict the general similarity in the parking use of the G. Fox and Municipal Garages. Parking activity at both garages reflects the magnitude of sales at G. Fox and Company. Thursdays and Saturdays — the heaviest shopping days have the greatest total number of parkers, December is the heaviest month. The maximum day at the G. Fox and Company Garage has nearly twice the parkers found on an average day.

by the city through its power of eminent domain. It was developed by the city, based on municipally financed general obligation bonds at interest rates of about 2.8 per cent. Development costs approximated \$2.3 million — about \$2.9 million when interest is included. This equals approximately \$2,750 per space.

Gross revenues increased gradually from \$169,000 in 1956-57 to \$257,000 in 1962-63, and within the past few years the garage has been self-liquidating. Incomes derived by the city have increased from \$108,000 in 1956-57 to \$185,000 in 1962-63, while the return to the operator has generally ranged from \$71,000 to \$77,000 annually. Approximately three fourths of the garage income is derived from transient parkers, with monthly and weekly patrons providing the remaining revenue.

As a municipally developed parking facility, the garage has a coverage of at least 1.5. Assuming financing by private enterprise based on two thirds of the total development costs, a six per cent 25-year loan, and payments of real estate taxes (about \$45,000 annually), the facility would be self-liquidating. Although it would offer no substantial return on its capital investment, its revenues would be adequate to permit operation as an adjunct to office buildings or stores.

The garage serves workers and shoppers. Both in 1955 and 1961, about 40 per cent of all parkers had destinations at G. Fox. However, the number of all-day parkers has increased as the G. Fox garage expanded, and new parking areas developed in Constitution Plaza concurrently with shifts of certain downtown activities.

**Pigeon Hole Garage** — This 165-space facility, located on the south side of Allyn Street between Trumbull and Ann Streets, was developed in 1955 by an independent private parking operator to augment the capacity of an existing lot. In recent years, the Allyn Hotel (on the corner of Trumbull and Asylum Streets) was demolished and the lot adjacent to the garage extended on land leased by the garage operator. The site of these lots has been recommended for garage development as part of "Trumbull Center" renewal plans.

**Constitution Plaza Garages** — The Constitution Plaza redevelopment project, opened in early 1963, was developed mainly by Travelers Insurance Company in cooperation with the city. It provides 600,000 square feet of office buildings and 200,000 square feet of retail area. The Phoenix Mutual Building, located to the south of the Plaza, will supply another 200,000 square feet of floor area. Ultimately, these developments will contain 6,000 employees.

The Plaza's two underground garages (mainly located above actual street levels) provide 1,825 parking spaces. An additional garage and parking lot, with a combined capacity of 750 spaces, are being developed as part of the Phoenix Mutual project. In total, approximately 2.5 spaces are provided for each 1,000 square feet of floor space.

Monthly spaces are allocated to various land uses based on square foot occupancy within the Plaza. Some 210 spaces are designated for two banks, 150 for the hotel, and 500 for retail uses; approximately 800 spaces for use on a monthly basis.

Although the number of parking spaces was stipulated in agreements between the city and developers, the need for attractive parking was clearly recognized. Availability of off-street parking was prerequisite for private investment in Constitution Plaza and a basic requirement for mortgages. A medical center reportedly located in Constitution Plaza *only* because of conveniences afforded by off-street parking.

**Economic Values of Parking** — Preceding analyses have shown how parking facilities confer benefits on adjacent land and are also financially feasible investments.

To the land-owner, open-lot parking serves as an interim use and often



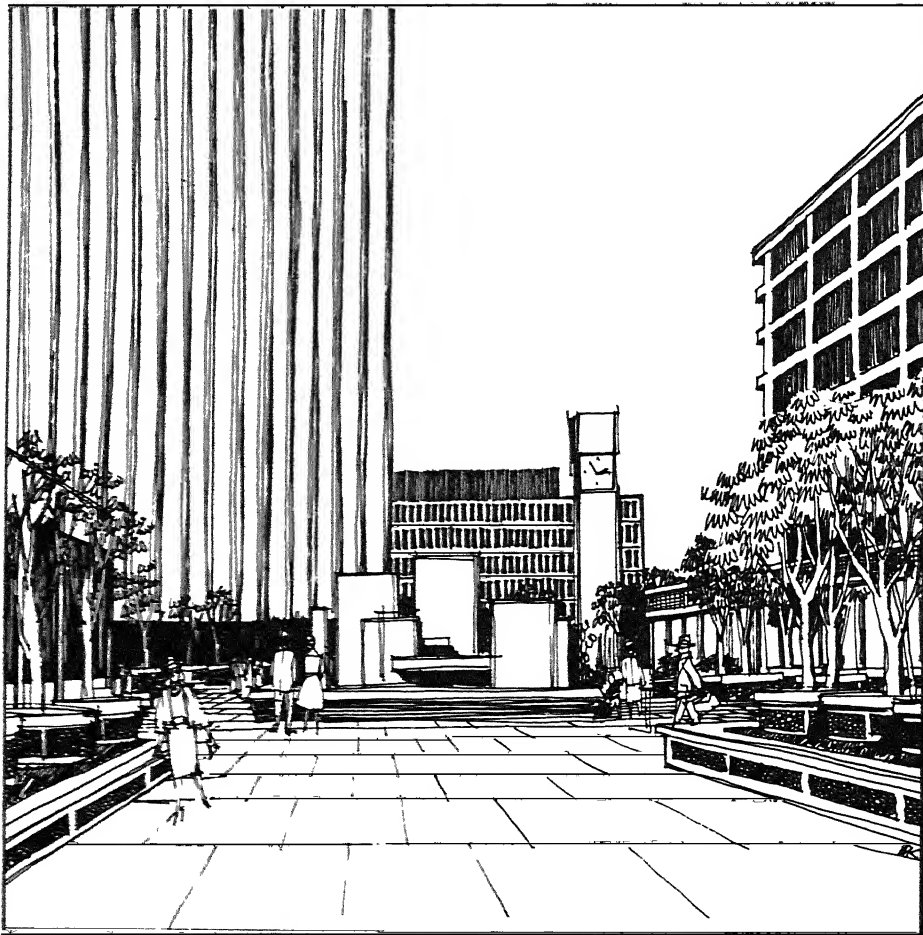


FIGURE 48  
RENDERING OF CONSTITUTION PLAZA  
HARTFORD, CONNECTICUT

achieves rates of return comparable with those obtained from surrounding properties. In other cases, parking lots minimize revenue losses to owners, while land is retained for possible future investment. Parking lot operators aggregate \$2 million annually in downtown Hartford.

Economic returns to the city result from both direct and secondary benefits. The city owns and leases two downtown parking facilities – the Church Street garage and Front Street lot. An annual income of \$185,000 is derived from the garage while the lot returns \$15,000 annually.

Secondary benefits accrue from stabilization of labor supply, enhancement of retail sales, and stimulation of building activity. Major downtown activities have endorsed employee and customer parking as necessary to their business operations.

## **Parking and the Future of Downtown**

Hartford's multifaceted urban renewal program is focused largely on downtown and its environs. The projects relate closely to existing and planned freeways and off-street parking facilities. As shown by Figure 49, urban renewal and major transportation projects are interdependent and complementary. Constitution Plaza illustrates this interdependence.

In conjunction with urban renewal and freeway developments, opportunities exist for bus service improvements to, from, and within downtown. Street patterns, topography, freeway linkages, and downtown land uses provide good possibilities for development of off-street transit terminals, and exclusive bus lanes, or special bus rights-of-way. Efficient transit service to the core emerges as a logical complement to off-street parking.

Finally, the economic values of downtown parking must be viewed from a broader base than the returns to operators and land owners and conveniences rendered to motorists. New parking facilities largely reflect desires of major stores to maintain their competitive positions by providing or expanding off-street parking. They also are the result of active downtown redevelopment where parking is prerequisite for investment, or as adjuncts to modernization or enlargement of existing office buildings stimulated by urban renewal.

### **SUMMARY OF SIMILARITIES AND DIFFERENCES**

Similarities and differences between the two downtown areas in economy and parking developments can be summarized as follows:

Downtown Los Angeles has traditionally experienced comparatively few pressures for centralization, largely because of opportunities for lateral expansion. Postwar growth has occurred primarily on the fringes of downtown, which have attractive freeway access and lower land costs; and many downtown-type developments have occurred elsewhere within the city, as along Wilshire Boulevard.

In contrast, Hartford's compact business district receives strong impetus for development from insurance companies (both in choice of central locations and in attitude toward downtown); moreover, physical and land-use controls limit expansion to a greater extent.

Recent parking developments in downtown Los Angeles have included both garages and lots, while Hartford has mainly constructed special-purpose garages within its core. Hartford's parking developments typify those in most other city centers.

Although problems of multiple land ownership and site acquisition have been apparent in both CBD's, most parking has been developed by private interests. However, department stores and insurance companies have dominated Hartford's downtown parking developments.

Off-street parking in both central business districts is an important com-

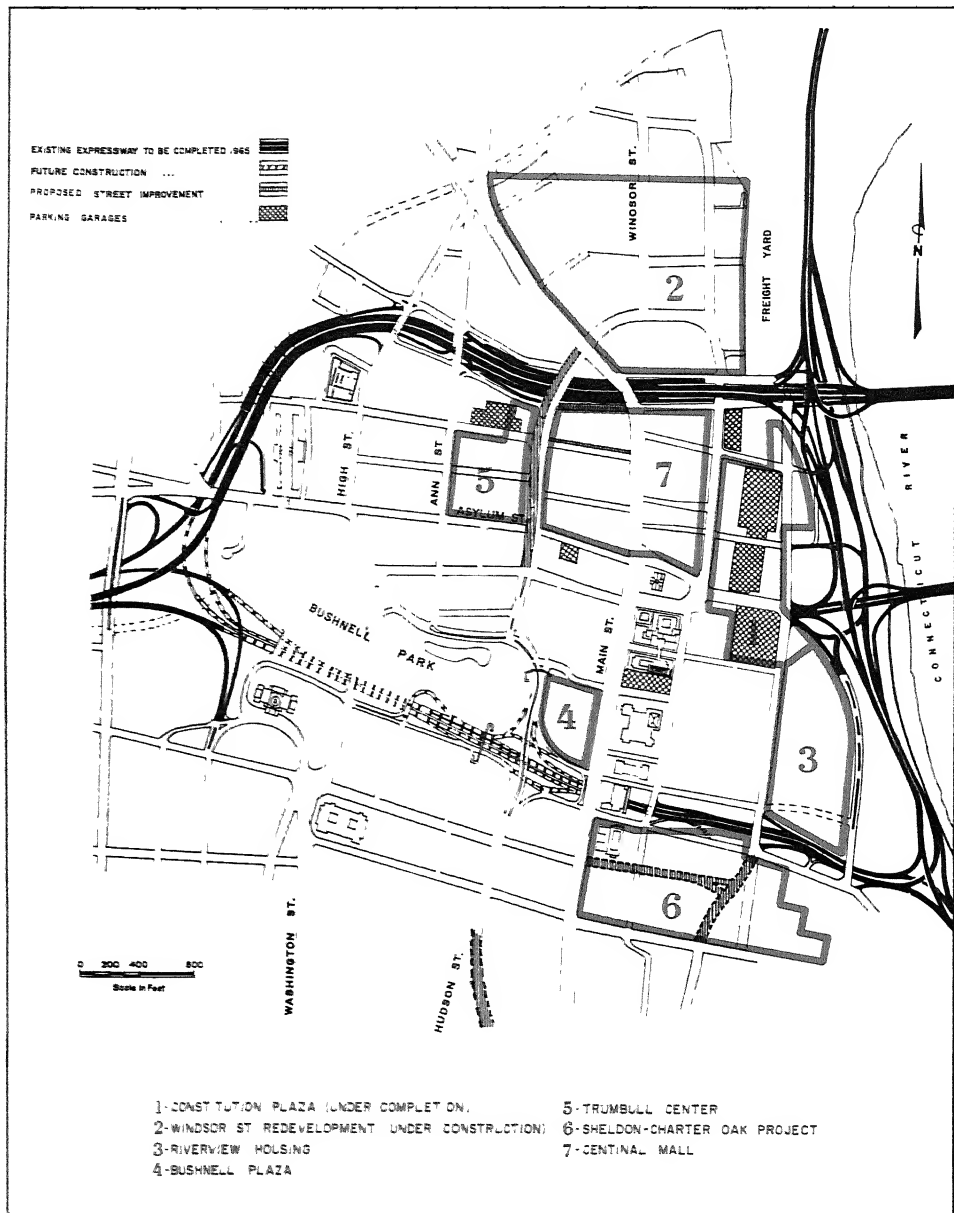


FIGURE 49

MAJOR REDEVELOPMENT PROJECTS IN RELATION TO EXPRESSWAY,  
 ARTERIAL, AND PARKING FACILITIES  
 CENTRAL BUSINESS DISTRICT  
 HARTFORD, CONNECTICUT

plementary land use which provides convenience and service to major generators. Both CBD's have approximately 0.75 parking spaces per thousand square feet of floor area.

Parking usually is a profitable investment in both city centers, since it frequently provides returns to renters and land owners comparable to those obtained from other adjacent uses. It is also important as an investment-decision factor. Its value to retail establishments is apparent: all major outlets in downtown Los Angeles offer parking validation plans; in Hartford both major department stores provide nearby multideck garages.

Redevelopment plans in both central business districts are replacing parking lots with more intensified land uses and garages. Los Angeles' Bunker Hill is converting perimeter land containing lots and substandard uses to residential and office units; Hartford is undertaking a multifaceted renewal program, geared to revitalizing its core area. Thus, urban renewal, in conjunction with parking garage development, will tend to strengthen both CBD's. Consequently, Hartford's downtown focus may shift eastward toward Constitution Plaza; in Los Angeles the shift will likely be westward toward Wilshire Boulevard.

Both central business districts are served by freeways. In Los Angeles, major facilities are completed, while in Hartford several are still under construction.

Transit is important to both downtown areas. Los Angeles, because of its size, is considering a rapid transit system to supplement express buses on freeways; in Hartford, completion of the freeway system will provide excellent opportunities for express bus service.

Finally, both central business districts reflect the expansion and promise of continued growth evident in the 1920's. In both cities, as throughout the nation, these prospects were never realized in the past. In turn, a "new equilibrium" gradually emerged between downtown and other urban land. And accessibility continues to be an important determinant in the relative distribution of these land values.

## **Generalization and Extension**

The foregoing analyses suggest the following generalizations regarding the role and impact of off-street parking in American city centers.

Downtown areas usually have an abundance of land for development. Many parking facilities reflect the limited demands for CBD land use.

As an important secondary use of downtown land, parking supplements rather than replaces other principal activities. Parking frequently occupies vacant land or locates on land formerly containing less productive uses.

Parking lots serve as an economical interim land use by replacing obsolete or unproductive buildings. Moreover, core or integral parking garages related directly to major CBD activities appear increasingly valuable as invest-

ments, as services to special land uses, or as incentives for attracting downtown investments.

In conjunction with freeways and urban renewal, multideck garages can both contain and reinforce downtown. By creating developmental pressure, or changing the relative position of selected locations, they can serve to increase downtown intensity.

## *Appendices*

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*Appendix A*

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*PARKING CHARACTERISTICS  
IN SELECTED CITIES*

TABLE A-1

## DETAILED PARKING CHARACTERISTICS FOR SELECTED URBAN AREAS

NAME OF CITY	Annapolis, Maryland	Asbury Park, New Jersey	Bethesda, Maryland	Buffalo, New York	Chattanooga, Tennessee	Charlotte, North Carolina	Clarksburg, W. Virginia	Clearwater, Florida	Columbia, South Carolina	Dayton, Ohio	Englewood, New Jersey	Flint, Michigan	Grand Rapids, Michigan	Greenwich, Connecticut	Hollywood, Florida	Jamaica, New York	Juneau, Alaska	Lansing, Michigan	Lexington, Kentucky	Maryville, Tennessee	Montgomery, Alabama
YEAR	1960	1959	1958	1962	1960	1961	1960	1959	1959	1958	1955	1963	1956	1958	1960	1962	1962	1960	1967	1961	1960
(A) General																					
Urbanized Area Population	23,385 <sup>1</sup>	17,366 <sup>1</sup>	56,527 <sup>1</sup>	1,054,370	205,143	209,551	28,112 <sup>1</sup>	34,653 <sup>1</sup>	162,601	501,664	26,057 <sup>1</sup>	277,786	294,230	53,795 <sup>1</sup>	35,237 <sup>1</sup>		6,797 <sup>1</sup>	169,325	111,940	10,348 <sup>1</sup>	142,893
Vehicle Registration	7,000	6,000	15,000	340,000	57,000	75,000	10,000	13,000	74,000	186,000	7,000	103,000	109,000	22,000	14,000			63,000	37,000	3,000	48,000
Vehicles/Capita	.300	.346	.265	.323	.278	.357	.357	.375	.454	.370	.269	.370	.370	.409	.397			.370	.330	.300	.336
(B) Inventory (Spaces)																					
Curb	1,087	683	1,186	647	1,438	806	304	983	2,304	1,048	969	668	1,594	1,301	993	951	297	1,505	1,617	231	3,510
Lots	1,021	686	5,478	2,638	4,093	10,187	2,037	3,541	4,291	10,024	967	4,351	6,163	2,866	1,285	4,416	543	3,324	3,401	834	2,684
Garage				3,324	1,377	1,124			308	1,666			2,057	276					1,258		950
TOTAL	2,108	1,369	6,664	6,609	6,908	12,117	2,341	4,524	6,903	12,738	1,936	5,019	9,814	4,443	2,278	5,367	840	4,829	6,276	1,065	7,144
Spaces/Capita	.090	.079	.118	.006	.034	.058	.083	.131	.042	.025	.074	.018	.033	.082	.065			.029	.056	.103	.050
Spaces/Vehicle	.301	.228	.444	.019	.121	.162	.234	.348	.093	.068	.276	.049	.090	.202	.163			.077	.170	.355	.149
Average Rates					.27	.29				.34		.23									.25
Hourly					.57	.46				.73		.53									.50
Daily																					10.00
Monthly																					
(C) Characteristics																					
Maximum Accumulation	1,362	1,167	4,445	4,913	5,212	6,458	1,394	2,549	5,300	9,966	930	2,850	8,535	4,759	1,445	4,060	632	3,700	4,234	668	5,667
Per Capita	.058	.067	.079	.005	.025	.031	.050	.074	.033	.020	.036	.010	.029	.088	.041			.022	.038	.065	.040
Per Vehicle	.194	.194	.296	.014	.091	.086	.139	.196	.072	.054	.133	.028	.078	.216	.103			.059	.114	.223	.118
Total Parkers	7,378			18,491	20,632			10,508	24,209	24,785		10,582	24,384		7,236			14,385	18,139	3,814	25,374
Per Capita	.316			.090	.098			.303	.149	.049		.038	.083		.205			.085	.162	.369	.178
Per Vehicle	1,054			.324	.275			.808	.327	.133		.103	.224		.517			.228	.490	1,271	.529
Per Parking Space												2.108								3.581	3.552
Trip Purpose																					
Shop	32	54	34	21	25	21		22	28	20	8	35	23	38	40	62	25	27	23	48	27
Business	39	21	39	56	35	34		35	37	41	42	32	35	23	35	16	37	24	36	36	33
Work	12	16	21	22	18	36		15	20	19	36	22	22	23	5	11	7	33	18	9	19
Other	17	9	6	1	22	9		28	15	20	14	11	20	16	20	11	31	16	23	7	22
Average Walking Distance (Ft.)	314	559	300	490	456	560		350	288	728	260	680	683	473	552	772	193		596	259	281
Average Duration (Min.)	68	150	89	126	112	150		78	90	126		144	132	162	78	144	30	198	96	41	87
(D) Demands & Needs																					
Total Present Demand	1,284	1,980	5,750	8,518	4,311	9,194	1,450	3,094	6,410	10,376	1,165	3,864	8,514	3,969	1,694	4,014	742	3,887	4,632	750	5,747
Per Capita	.055	.114	.102	.008	.021	.044	.052	.089	.039	.021	.045	.014	.029	.074	.048			.023	.041	.072	.040
Per Registered Vehicles	.183	.330	.383	.025	.076	.123	.145	.238	.086	.056	.166	.037	.078	.180	.121			.062	.125	.250	.120
Total Needs (Present)	76	790	573	2,626	880	580	110	100	50	600			110		168		55				
Per Capita	.003	.045	.010	.002	.004	.003	.004	.003	.0003	.001			.0003		.005			.005	.005	.001	.002
Per Registered Vehicles	.011	.132	.038	.008	.015	.008	.011	.008	.0006	.003			.0010		.012			.013	.016	.003	.006

<sup>1</sup>1960 census



TABLE A-1 (Cont'd)																						
DETAILED PARKING CHARACTERISTICS FOR SELECTED URBAN AREAS																						
NAME OF CITY	Montgomery Hills, Maryland	Nashville, Tennessee	New Orleans, Louisiana	Parkersburg, W. Virginia	Philadelphia, Pennsylvania	Pittsburgh, Pennsylvania	Riverside, California	St. Joseph, Missouri	Santa Monica, California	Santa Rosa, California	Silver Spring, Maryland	Stockton, California	Suffolk, Virginia	Tampa, Florida	Trenton, New Jersey	Tulsa, Oklahoma	West Warwick, Rhode Island	Wheaton, Maryland	N. Wilkesboro North Carolina	Wilmington, Delaware	Winston-Salem, North Carolina	Woonsocket, Rhode Island
YEAR	1963	1961	1960	1955	1957	1955	1958	1960	1958	1962	1963	1956	1957	1958	1960	1964	1957	1963	1957	1957	1957	1955
(A) General																						
Urbanized Area Population		346,729	845,237	44,797 <sup>1</sup>	3,635,228	1,804,400	377,531	81,187	83,249 <sup>1</sup>	31,027 <sup>1</sup>	66,348 <sup>1</sup>	141,604	12,609 <sup>1</sup>	301,790	242,401	298,922	21,414 <sup>1</sup>	54,635 <sup>1</sup>	4,197 <sup>1</sup>	283,667	128,176	47,080 <sup>1</sup>
Vehicle Registration		112,000	217,000	16,000	909,000	531,000	135,000	31,000	35,000	11,000	18,000	52,000	3,000	112,000	69,000	120,000	7,000		1,000	92,000	46,000	15,000
Vehicles/Capita		.323	.256	.357	.250	.294	.357	.385	.417	.345	.270	.370	.263	.370	.286	.400	.323		.357	.323	.357	.323
(B) Inventory (Spaces)																						
Curb	70	3,109	1,453	1,116	6,342	568	1,250	1,757	1,672	2,379	1,299	2,477	355	1,490	336	2,661	623	627	347	2,635	958	113
Lots	380	8,188	6,076	1,520	19,123	8,160	2,261	2,136	4,336	2,867	6,331	2,390	633	1,904	1,747	7,598	793	2,047	200	3,089	2,563	815
Garage		3,792	6,105		13,559	6,102						350		204		2,488					1,941	
TOTAL	450	15,089	13,634	2,636	39,024	14,830	3,511	3,893	6,008	5,246	7,630	5,217	988	3,598	2,083	12,747	1,416	2,674	547	5,724	5,462	928
Spaces/Capita		.044	.016	.059	.011	.008	.009	.048	.072	.169	.115	.037	.078	.012	.009	.043	.066	.049	.130	.020	.043	.020
Spaces/Vehicle		.135	.063		.043	.028	.026	.126	.172	.477	.424	.100	.329	.032	.030	.107	.202		.547	.062	.119	.062
Average Rates																						
Hourly			.41											.35		.24						
Daily		.67	.91											.65								
Monthly														6.00								
(C) Characteristics																						
Maximum Accumulation	289	11,182	12,167		22,640	15,104	3,384	2,831	3,665	3,808	6,314	4,752	610	3,145	1,780	9,238	858	1,734	264	5,314		437
Per Capita		.032	.014		.006	.008	.009	.035	.044	.123	.095	.034	.048	.010	.007	.031	.040	.032	.063	.019		.009
Per Vehicle		.100	.056		.025	.028	.025	.091	.105	.346	.351	.091	.203	.028	.026	.077	.123		.264	.058		.029
Total Parkers	28,789	29,373	10,057	45,325	29,971	16,600	9,354	23,140	16,240	13,809	24,674	3,858		5,893	30,383				1,723	22,254		3,253
Per Capita		.083	.035	.225	.012	.017	.044	.115	.278	.523	.208	.174	.306		.024	.102			.410	.078		.069
Per Vehicle		.257	.135	.629	.050	.056	.123	.302	.661	1.476	.767	.474	1.286		.085	.254			1.723	.242		.217
Per Parking Space		1.908	2.154	3.815	1.161	2.021	4.728	2.403	3.852	3.096	1.810	4.730	3.905		2.829	2.384			3.150	3.888		3.505
Trip Purpose																						
Shop	45	17	11	39	12	12	27	30	46	45	36	30	40			14	62	33	38	25		28
Business	40	37	30	31	45	35	34	35	30	31	35	36	36			48	14	36	29	38		38
Work	7	33	32	24	30	41	19	20	12	10	20	16	19			26	6	24	10	16		11
Other	8	13	27	6	13	12	20	15	12	14	9	18	5			12	18	7	23	21		23
Average Walking Distance (Ft.)	120	500	478		827	325	406	260	340	406	457				690	459	330	210	293	439		325
Average Duration (Min.)	39	157	156	89	220	270	90	90	66	54	120	78			186	128	84	116	44	96		60
(D) Demands & Needs																						
Total Present Demand	353	10,525	10,582	3,016	35,128	16,494	3,198	3,005	3,550	3,382	6,483	5,025	676	5,004	1,664	7,594	920	1,569	295	5,644	4,345	450
Per Capita		.030	.013	.067	.010	.009	.008	.037	.043	.109	.098	.035	.054	.017	.007	.025	.043	.029	.070	.020	.034	.010
Per Registered Vehicles		.094	.049	.189	.039	.031	.024	.097	.101	.307	.360	.097	.225	.045	.024	.063	.131		.295	.061	.094	.030
Total Needs (Present)	3	1,976	920	662	999	2,358	244	345	390	282	493			1,760	670	600				208		137
Per Capita		.006	.001	.015	.0002	.001	.001	.004		.013	.004	.003		.006	.003	.002				.001		.003
Per Registered Vehicles		.018	.004	.041	.0010	.004	.002	.011		.035	.016	.009		.016	.010	.005				.002		.009

<sup>1</sup>1960 census

**TABLE A-2**

**PARKING ACCUMULATION AND TRIP PURPOSE**

**NEW ORLEANS CENTRAL BUSINESS DISTRICT**

Typical 1960 Weekday

10:00 A.M. — 6:00 P.M.

TRIP PURPOSE	TIME OF MAXIMUM ACCUMU- LATION	TOTAL PARKERS 10:00 A. M. - 6:00 P. M.	MAXIMUM ACCUMU- LATION	RATIO OF MAXIMUM ACCUMU- LATION TO TOTAL
Shopping.....	12:30 P. M.	3,389	968	.29
Business.....	1:00 P. M.	9,203	1,948	.21
Work.....	11:00 A. M.	9,755	7,385	.76
Sales-Service.....	10:30 A. M.	824	165	.20
Load-Unload.....	10:30 A. M.	953	160	.17
Other.....	1:00 P. M.	7,537	1,739	.23
ALL PURPOSES.....	12:30 P. M.	31,661	12,167	.38

SOURCE: Parking, Central Business District, New Orleans, Louisiana, Wilbur Smith and Associates, Volume I, 1960.

**TABLE A-3**

**SHOPPER PURCHASES RELATED TO TRAVEL MODE**

**CHATTANOOGA AND KNOXVILLE, TENNESSEE<sup>1</sup>**

1961

PURCHASE	PER CENT OF TOTAL					All Modes
	Auto Drivers	Auto Passengers	Transit Passengers	Taxi Passengers	Pedestrians	
\$10 or More.....	35.9 <sup>1</sup> (28.8)	28.7 (28.7)	25.0 (26.6)	31.1 (45.7)	18.4 (16.9)	30.0 (27.6)
\$3 to \$10.....	19.2 (17.2)	19.9 (17.1)	21.3 (18.7)	20.6 (19.7)	17.9 (9.2)	19.9 (17.4)
Less Than \$3.....	11.2 (17.6)	15.0 (19.6)	12.4 (21.8)	14.1 (18.4)	15.0 (22.8)	12.7 (19.8)
None.....	33.7 (36.4)	36.4 (34.9)	41.3 (32.9)	34.2 (16.2)	48.7 (51.1)	37.4 (35.2)
TOTAL.....	100.0	100.0	100.0	100.0	100.0	100.0
Trips Per Day.....	11,452 (13,870)	6,669 (8,709)	8,464 (13,588)	538 (457)	1,644 (1,730)	28,767 (38,354)

<sup>1</sup>Legend: 35.9 — Chattanooga  
(28.8) — Knoxville

SOURCE: Transportation Program, Chattanooga, Tennessee, Wilbur Smith and Associates, 1961; Mass Transportation in the Knoxville Metropolitan Area, Wilbur Smith and Associates, 1963.

**TABLE A-4**  
**TRENDS IN TOTAL OFF-STREET PARKING SPACES**  
**HOUSTON CENTRAL BUSINESS DISTRICT**

TYPE OF FACILITY	JUNE 1953	JULY 1964	SEPTEMBER 1967	DECEMBER 1968	APRIL 1969	CHANGES 1960-1969				NET CHANGE
						Additions Facilities	Additions Spaces	Deletions Facilities	Deletions Spaces	
Lots, Public	8,521	8,624	12,490	13,012	13,635	15	1,107	8	484	+ 623
Lots, Private	1,396	1,805	1,022	1,235	1,259	9	353	6	140	+ 24
Garages, Public	5,399	6,419	8,449	9,293	10,357	5	1,064	0	0	+1,064
Garages, Private	313	313	310	312	289	2	20	2	43	- 23
TOTAL	15,629	17,161	22,271	23,852	25,540	31	2,544	16	667	+1,688
Per Cent Net Change		+9.8	+29.8	+7.1	+6.6					+ 6.6
Per Cent Average Yearly Change		8.4	9.4	3.2	5.0					5.0

Note: 820 spaces were deleted for First City National Bank construction. A 785-space garage was included in the new building program.  
SOURCE: Department of Traffic and Transportation, City of Houston.

TABLE A-5

SUMMARY OF BUILDING REQUIREMENTS IN VARIOUS CITIES  
RELATING TO PARKING STRUCTURES

CITY	SPECIAL PASSENGER CAR REQUIREMENTS	OPEN DECK PARKING	FLOOR LOADS (LBS. PER SQ. FT.)	EXPOSED STEEL 1 - COLUMNS 2 - GIRDERS 3 - FRAMING	SPRINKLERS	FLOOR TO CEILING HEIGHT	OPEN STAIRWAY	OPEN MANLIFTS
Atlanta, Ga.	Yes	Yes		1, 2, 3-Yes	No			Yes
Boise, Idaho		Yes		1, 2, 3-Yes	No	7'-0"	Yes	Yes
Baltimore, Md.	Yes	Yes	60#	1, 2, 3-Yes				Yes
Birmingham, Ala.	Yes	Yes					Yes up to 3 stories	Yes
Boston, Mass.		Yes				8'-0"		
Bridgeport, Conn.		Yes	70#		No			
Cincinnati, Ohio	Yes	Yes						
Columbus, Ohio		Yes				9'-0"		
Corpus Christi, Tex.		Yes			No	7'-0"		
Dallas, Tex.		Yes						Yes
Dayton, Ohio	Yes	Yes	Uniform 75#	1, 2, 3-Yes	No		Yes	Yes
Denver, Colo.	Yes	Yes					Yes	Yes
Grand Rapids, Mich.		Yes			No			
Kansas City, Mo.		Yes		2, 3-Yes		14'-0"		Yes
Lincoln, Neb.	Yes	Yes			No	8'-6"		
Los Angeles, Calif.			50# pass. cars only					
Madison, Wisc.		Yes		1, 2, 3-Yes	No	8'-0"	Yes	
Memphis, Tenn.	Yes	Yes	70#					
Milwaukee, Wisc.		Yes		1, 2, 3-Yes		8'-6"	Yes	Yes
Miami, Florida		Yes		1, 2, 3-Yes			Yes	Yes
Minneapolis, Minn.	Yes			1-Yes				
New Orleans, La.	Yes	Yes						
New York, N. Y.			75#	1, 2, 3-Yes	No		Yes	Yes
Omaha, Neb.	Yes	Yes	60# or 1,800# wheel loads	1, 2, 3-Yes	No	7'-6"	Yes	Yes
Philadelphia, Pa.		Yes	75# or 2,000# concentrated at point		No			
San Francisco, Calif.						8'-0"		Yes
Seattle, Wash.			75# live			7'-6"		
St. Paul, Minn.	Yes	Yes	70# upper 100# first	1, 2, 3-Yes	No		Yes	
Tacoma, Wash.		Yes				7'-0"		
Wichita, Kan.	Yes			1, 2, 3-Yes				
Detroit, Mich.	Yes	Yes		1, 2, 3-Yes	No			

SOURCE: H. K. Evans and C. O. Pratt, Wilbur Smith and Associates, 1959.

TABLE A-6

## CONSTRUCTION COST DATA FOR TYPICAL SELF-SERVICE PARKING GARAGES

TYPE SPAN	LOCATION IN U. S. AND YEAR BUILT	COSTS IN DOLLARS PER SQ. FT. OF CONSTRUCTION AREA				CAPAC- ITY, CARS	COST PER CAR SPACE, DOLLARS
		Concrete	Forms	Reinforcing Steel	Elevators		
Long span, 52-54 ft.	East Coast, 1959_____	1.29	0.97	0.83	0.31	565	1,600
	Middle East, 1958_____	0.79	1.36	0.97	0.35	380	1,800
	Middle East, 1959_____	0.68	0.94	0.85	0.47	617	1,570
	North Central, 1958_____	1.74		0.93	0.24	706	1,250
	North Central, 1959_____	0.75	0.83	0.68	0.26	556	1,390
	Central, 1957_____	1.83		0.78	0.28	452	1,200
	Northwest, 1958_____	0.74	0.76	0.75	0.27	630	1,400
	West Coast, 1958_____	1.00	0.71	0.86	0.25	630	1,600
Short span, 35 ft.	South, 1957_____	1.15		0.72	None	235	660

Note: Each line is for a separate project.

SOURCE: Journal of the American Concrete Institute, December, 1969.

**TABLE A-7**

**PHYSICAL AND FINANCIAL FACTS REGARDING  
SAN FRANCISCO GARAGES  
1959**

<u>ITEM</u>	<u>FIFTH &amp; MISSION GARAGE</u>	<u>SUTTER-STOCKTON GARAGE</u>	<u>CIVIC CENTER GARAGE</u>
Parking Area.....	399,000 sq. ft.	390,600 sq. ft.	355,674 sq. ft.
Store Area.....	—	31,300 sq. ft.	—
Total Area.....	399,000 sq. ft.	421,900 sq. ft.	355,674 sq. ft.
Number of Parking Stalls			
Self-Parking.....	1,023	932	954
Attendant-Parking.....	—	—	1,461
Construction Contract Price.....	\$1,500,000	\$2,530,000	\$3,392,460
Demolition Cost.....	105,000	212,000	—
Engineer and Architects' Fees (Computed at 6% of contract).....	90,000	151,103	203,540
Surface Restoration Expense.....	—	—	154,000
Total Construction Cost (including all other fees, commissions and interest reserves).....	\$2,135,000	\$3,680,000	\$4,500,000
Land Acquisition Cost.....	1,600,000	2,550,000	—
Total Project Cost.....	\$3,735,000	\$6,230,000	\$4,500,000
Construction Contract Price:			
Per square foot.....	\$ 3.76	\$ 6.00	\$ 9.53
Per stall.....	1,835.00	2,714.00	\$ 3,556 <sup>1</sup>
			\$ 2,322 <sup>2</sup>
Total Construction Cost:			
Per square foot.....	\$ 5.37	\$ 8.72	\$ 13.40
	1,971.00	3,948.00	\$ 4,717 <sup>1</sup>
			\$ 3,080 <sup>2</sup>
Land Acquisition Cost Per Stall.....	\$ 1,477.00	\$ 2,736.00	—
Total Project Cost Per Stall.....	\$ 3,448.00	\$ 6,684.00	\$ 4,717 <sup>1</sup>
			\$ 3,088 <sup>2</sup>

<sup>1</sup>Self-parking.

<sup>2</sup>Attendant-parking.

SOURCE: San Francisco Parking Authority.

TABLE A-8

**SUMMARY OF UNIT PARKING DEMANDS FOR  
PRIVATE RESIDENCES, MOTELS, AND HOTELS  
LOS ANGELES  
1962**

ITEM	RESIDENTIAL USAGE				
	Single Family	Multi-Family		Motels	Hotels
		2-4 D.U.'s Per Building	Over 4 D.U.'s Per Building		
Number of Interviews_____	223	32	205	15	13
Existing Parking Per D.U. or Room					
Off-Street_____	2.8	1.1	1.1	0.8	1.1
Curb_____	2.8	4.4	0.5	0.1	1
Average Reported Parking Demand Per D.U. or Room					
<b>RESIDENTS</b>					
Day_____	1.6	0.9	1.1	1.1	0.7
Night_____	2.0	1.3	1.3	1.1	0.6
<b>VISITORS</b>					
Day_____	0.2	0.2	0.2	0.0	0.0
Night_____	0.2	0.3	0.3	0.0	0.0
<b>EMPLOYEES</b>					
Day_____	0.2	0.0	1	0.1	0.2
Night_____	0.0	0.0	1	0.0	0.1
<b>SERVICE VEHICLES</b>					
Day_____	0.5	0.2	0.1	1	0.1
Night_____	0.0	0.0	0.0	1	1
<b>TOTAL</b>					
Day_____	2.5	1.3	1.4	1.2	1.0
Night_____	2.2	1.6	1.6	1.1	0.7

<sup>1</sup>Less than 0.1.

Note: Day is defined as 6 A. M. - 6 P. M.; night as 6 P. M. - 6 A. M.

SOURCE: A Study of Residential Parking Requirements, Los Angeles, California, Wilbur Smith and Associates, 1963.

**TABLE A-9**  
**RESIDENTIAL PARKING DEMANDS**  
**PHILADELPHIA**  
**1957**

UNITS	PARKING SPACES PER DWELLING UNIT			
	Downtown-Rittenhouse Square			Outlying High-Rise Apartment "Parkway House"
	High-Rise Apartments	2-4 Floor Apartments	Private Houses	
Residents.....	0.47	0.34	1.02	0.68
Visitors.....	0.11	0.18	0.20	0.19
TOTAL.....	0.58	0.52	1.22	0.87

SOURCE: Survey by Wilbur Smith and Associates reported in Washington Square East Urban Renewal Area Unit I Society Hill Technical Report, June, 1958. Prepared by Wright, Andrade & Amenta, Architects for the Redevelopment Authority of the City of Philadelphia.

**TABLE A-10**  
**ORIGIN MODES OF CENTRAL BUSINESS DISTRICT WORKERS**  
**CHICAGO**  
**1956**

ORIGIN MODE	PERCENTAGE DISTRIBUTION — DESTINATION MODE						Total
	1	2	3	4	5	6	
1. Auto Driver.....	12.3	—	0.7	2.3	4.4	—	19.7
2. Auto Passenger.....	—	4.2	0.8	1.8	4.6	—	11.4
3. Bus.....	—	—	22.3	15.8	1.1	—	39.2
4. Rapid Transit.....	—	—	0.5	13.2	—	—	13.7
5. Commuter Railroad.....	—	—	0.7	0.4	12.0	—	13.1
6. Other.....	—	—	—	—	—	2.9	2.9
TOTAL.....	12.3	4.2	25.0	33.5	22.1	2.9	100.0

NOTE: Origin mode refers to mode used at home end and destination mode refers to mode used on entry to CBD. For example, 4.4 per cent of all trips begin as auto drivers and end as commuter passengers.

SOURCE: Adapted from the Chicago Area Transportation Study by J. F. Kain, in "Commuting and the Residential Decisions of Chicago and Detroit Central Business Workers," presented at the Conference on Transportation Economics, April 26-27, 1963, New York, N. Y.



*Appendix B*

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*ADDITIONAL TABLES – PARKING  
IN LOS ANGELES AND HARTFORD*

**TABLE B-1**

**LOS ANGELES CITY CENTRAL BUSINESS DISTRICT RETAIL SALES  
AS A PERCENTAGE OF TOTAL METROPOLITAN AREA SALES**  
Selected Years — 1929 to 1959

YEAR	C.B.D. <sup>2</sup> RETAIL SALES (thousands)		C.B.D. <sup>2</sup> RETAIL SALES AS PER CENT OF LOS ANGELES METROPOLITAN AREA RETAIL SALES	
	Total	Department Store	Total	Department Store
1929 <sup>1</sup>	\$328,850	\$106,761	24.9	75.0
1939 <sup>1</sup>	199,520	77,091	14.6	54.0
1948 <sup>1</sup>	451,009	181,003	9.8	38.1
1954 <sup>1</sup>	421,003	144,211	6.1	27.0
1958 <sup>2</sup>	NA	121,300	NA	19.6
1959 <sup>2</sup>	NA	125,300	NA	18.2

<sup>1</sup>Census Data.

<sup>2</sup>Estimate.

<sup>3</sup>As defined by the U. S. Bureau of the Census (Includes Census Tracts 112, 117, 180, 181, 182, 183, 184, 185A, 185B).

NA = Not Available.

SOURCE: Department Store Sales, Security First National Bank — Monthly Summary of Business Conditions in Southern California, December, 1959.

Total Retail Sales, Los Angeles Chamber of Commerce — Downtown Los Angeles Report, File No. 274, February, 1957.

**TABLE B-2**

**DEPARTMENT STORE SALES IN DOWNTOWN LOS ANGELES**  
1929 to 1959

YEAR	DOWNTOWN SALES	DOWNTOWN SALES AS PER CENT OF METROPOLITAN AREA TOTAL <sup>1</sup>
1929	\$106,761,000 <sup>2</sup>	75.0
1939	77,090,000 <sup>2</sup>	54.0
1946	186,900,000 <sup>3</sup>	49.6
1947	185,300,000 <sup>3</sup>	41.7
1948	181,003,000 <sup>2</sup>	38.1
1949	164,300,000 <sup>3</sup>	37.7
1950	167,100,000 <sup>3</sup>	36.4
1951	166,300,000 <sup>3</sup>	35.3
1952	156,200,000 <sup>3</sup>	29.9
1953	150,900,000 <sup>3</sup>	28.6
1954	144,211,000 <sup>2</sup>	27.0
1955	143,800,000 <sup>3</sup>	24.6
1956	138,900,000 <sup>3</sup>	22.6
1957	129,200,000 <sup>3</sup>	21.0
1958	121,300,000 <sup>3</sup>	19.6
1959	125,300,000 <sup>3</sup>	18.2

<sup>1</sup>The figures for the years 1929, 1939, and 1947-1953 show the downtown percentage of the Los Angeles County Area department store sales only.

<sup>2</sup>Census.

<sup>3</sup>Estimate.

SOURCE: Security First National Bank — Monthly Summary of Business Conditions in Southern California, December, 1955 and December, 1959 Issues. Boundaries of Downtown Area conform to those of U. S. Bureau of Census.

TABLE B-3

SUMMARY OF ZONING REGULATIONS  
CITY OF LOS ANGELES

CLASSIFICATION	ZONE	USE	HEIGHT STORIES FEET	FRONT FEET	YARDS SIDE REAR	AREA PER LOT PER DWELLING UNIT	MINIMUM LOT WIDTH	PARKING SPACE	EDGE FENCE REQUIREMENTS
RESIDENTIAL	RE	RESIDENTIAL ESTATE ONE-FAMILY DWELLINGS PARKS - PLAYGROUNDS COMMUNITY CENTERS TRUCK GARDENING - HORSES	3 45 FT.	25 FT.	5 FEET 6' 3" SIDEREAR	25 FT. MAX 11,000 54 FEET	11,000 54 FEET	70 FT.	ONE GARAGE PER DWELLING UNIT
	RS	SUBURBAN ONE-FAMILY DWELLINGS PARKS - PLAYGROUNDS TRUCK GARDENING - HORSES	3 45 FT.	25 FT.	5 FEET 6' 3" SIDEREAR	20 FT. 7,500 54 FEET	7,500 54 FEET	60 FT.	ONE GARAGE PER DWELLING UNIT
	R1	ONE-FAMILY DWELLING RS USES	3 45 FT.	20 FT.	5 FEET 6' 3" SIDEREAR	15 FT. 5,000 54 FT 15,000 54 FT	5,000 54 FT 15,000 54 FT	50 FT.	ONE GARAGE PER DWELLING UNIT
	R2	TWO-FAMILY DWELLING R1 USES	3 45 FT.	20 FT.	5 FEET 6' 3" SIDEREAR	15 FT. 5,000 54 FEET	5,000 54 FEET	50 FT.	ONE GARAGE PER DWELLING UNIT
	R3	MULTIPLE DWELLING R2 USES - APARTMENT HOUSES MULTIPLE DWELLINGS	3 45 FT.	15 FT.	5 FEET 6' 3" SIDEREAR	15 FT. 5,000 54 FEET	800 TO 1,200 54 FEET	50 FT.	VARIES FROM ONE FOR ONE TO 1 1/4 FOR ONE
	R4	MULTIPLE DWELLING R3 USES - CHURCHES SCHOOLS - HOTELS	UNLIMITED*	15 FT.	5' PLUS 1' EACH STORY ABOVE 2ND 16 FT. MAX	15' PLUS 1' EACH STORY ABOVE 2ND 20 FT. MAX	5,000 54 FEET	400 TO 800 54 FEET	VARIES FROM ONE FOR ONE TO 1 1/4 FOR ONE
	R5	MULTIPLE DWELLING R4 USES - CLUBS - LODGES HOSPITALS - SANITARIUMS	UNLIMITED*	15 FT.	5' PLUS 1' EACH STORY ABOVE 2ND 16 FT. MAX	15' PLUS 1' EACH STORY ABOVE 2ND 20 FT. MAX	5,000 54 FEET	200 TO 400 54 FEET	VARIES FROM ONE FOR ONE TO 1 1/4 FOR ONE
AGRICULTURAL	RA	SUBURBAN R1 USES - LIMITED AGRICULTURAL USES - LIBRARIES - MUSEUMS CHURCHES - HORSES	3 45 FT.	25 FT.	5 FEET 6' 3" SIDEREAR	25 FT. 20,000 54 FEET	20,000 54 FEET	70 FT.	ONE GARAGE PER DWELLING UNIT
	A2	AGRICULTURAL RA USES - EXTENSIVE AGRICULTURAL USES - HOSPITALS OR SANITARIUMS	3 45 FT.	25 FT.	25 FT. MAX	25 FT. 2 ACRES	1 ACRE	MINIMUM AVERAGE LOT WIDTH 150 FT.	ONE SPACE PER DWELLING UNIT
	A1	AGRICULTURAL A2 USES	3 45 FT.	25 FT.	25 FT. MAX	25 FT. 5 ACRES	2 1/2 ACRES	MINIMUM AVERAGE LOT WIDTH 300 FT.	ONE SPACE PER DWELLING UNIT
PARKING	P	AUTOMOBILE PARKING SURFACE & UNDERGROUND PROPERTY IN A P ZONE MAY ALSO BE IN AN "A" OR "R" ZONE PARKING PERMITTED IN LIEU OF RESIDENTIAL OR AGRICULTURAL USES				AREA PER LOT AND UNIT	LOADING SPACE		
	PB	PARKING BUILDING AUTOMOBILE PARKING WITHIN OR WITHOUT A BUILDING	**		0', 5' OR 10' DEPENDENT ON ZONING IN BLOCK	5' TO 10' IF ABUTTING "A" OR "R" ZONE "A" OR "R" ZONE	FLOOR	FLOOR	
COMMERCIAL	CR	LIMITED COMMERCIAL MOST RS USES - OFFICE BUILDINGS BANKS - BUSINESS SCHOOLS NO MERCHANDISE DISPLAY OR SALE	6 75 FT.		10 FEET INTERIOR LOT EXCEPT ON MAJOR HIGHWAY	5' TO 10' CORNER LOT ONLY RESIDENTIAL USES - SAME AS IN RA ZONE	SAME AS RS FOR DWELLINGS OTHERWISE FLOOR	WHERE LOT ABUTS ALLEY	ONE SPACE FOR EACH 400 SQUARE FEET OF FLOOR AREA
	C1	LIMITED COMMERCIAL R3 USES - LOCAL RETAIL STORES, OFFICES OR BUSINESSES	UNLIMITED*		ONLY IF PART OF BLOCK IN DWELLING ZONE	NONE UNLESS LOT ABUTS DWELLING ZONE	SAME AS R1 FOR DWELLINGS OTHERWISE FLOOR	MINIMUM LOADING SPACE 400 SQUARE FEET	ONE SPACE FOR EACH 500 SQUARE FEET OF FLOOR AREA IN BUILDINGS CONTAINING 5,000 OR MORE SQUARE FEET
	C2	COMMERCIAL C1 AND R3 USES - RETAIL BUSINESS WITH LIMITED MANUFACTURING	UNLIMITED*		NONE	NONE FOR COMM'L BLDGS RESIDENTIAL USES - SAME AS IN RA ZONE	SAME AS R4 FOR DWELLINGS OTHERWISE FLOOR	ADDITIONAL SPACE REQUIRED FOR BUILDINGS CONTAINING MORE THAN 50,000 SQUARE FEET OF FLOOR AREA	MUST BE LOCATED WITHIN 750 FEET OF BUILDING
	C4	COMMERCIAL C2 USES (WITH EXCEPTIONS)	UNLIMITED*		NONE	NONE FOR COMM'L BLDGS RESIDENTIAL USES - SAME AS IN RA ZONE	SAME AS R5 FOR DWELLINGS OTHERWISE FLOOR	REQUIRED FOR BUILDINGS CONTAINING MORE THAN 50,000 SQUARE FEET OF FLOOR AREA	MUST BE LOCATED WITHIN 750 FEET OF BUILDING
	C5	COMMERCIAL C2 USES - LIMITED FLOOR AREA FOR LIGHT MANUFACTURING	UNLIMITED*		NONE	NONE FOR COMM'L BLDGS RESIDENTIAL USES - SAME AS IN RA ZONE	SAME AS R5 FOR DWELLINGS OTHERWISE FLOOR	REQUIRED FOR BUILDINGS CONTAINING MORE THAN 50,000 SQUARE FEET OF FLOOR AREA	MUST BE LOCATED WITHIN 750 FEET OF BUILDING
	CM	COMM'L. MANUFACTURING C2 USES - WHOLESALE BUSINESS STORAGE BUILDINGS LIMITED MANUFACTURING	UNLIMITED*		NONE	NONE FOR INDUSTRIAL OR COMM'L BLDGS RESIDENTIAL USES - SAME AS IN RA ZONE	SAME AS R5 FOR DWELLINGS OTHERWISE FLOOR	WHERE LOT ABUTS ALLEY	ONE SPACE FOR EACH 500 SQUARE FEET OF FLOOR AREA IN BUILDINGS CONTAINING 5,000 OR MORE SQUARE FEET
INDUSTRIAL	M1	LIMITED INDUSTRIAL CM USES - LIMITED INDUSTRIAL AND MANUFACTURING USES NO "R" ZONE USES	UNLIMITED*		NONE	NONE	NOTE "R" ZONE USES PROHIBITED	MINIMUM LOADING SPACE 400 SQUARE FEET	NONE
	M2	LIGHT INDUSTRIAL M1 USES - ADDITIONAL INDUSTRIAL USES STORAGE YARDS OF ALL KINDS NO "R" ZONE USES	UNLIMITED*		NONE	NONE	NOTE "R" ZONE USES PROHIBITED	ADDITIONAL SPACE REQUIRED FOR BUILDINGS CONTAINING MORE THAN 50,000 SQUARE FEET OF FLOOR AREA	NONE
	M3	HEAVY INDUSTRIAL M2 USES - ANY INDUSTRIAL USE NUISANCE TYPE 500 FEET FROM ANY OTHER ZONE - NO "R" ZONE USES	UNLIMITED*		NONE	NONE	NOTE "R" ZONE USES PROHIBITED	ADDITIONAL SPACE REQUIRED FOR BUILDINGS CONTAINING MORE THAN 50,000 SQUARE FEET OF FLOOR AREA	NONE
SUPPLEMENTAL USE DISTRICTS: (ESTABLISHED IN CONJUNCTION WITH ZONES)									
G ROCK AND GRAVEL • O OIL DRILLING • S ANIMAL SLAUGHTERING									
HEIGHT DISTRICTS	NO. 1	FLOOR AREA OF MAIN BUILDINGS MAY NOT EXCEED THREE TIMES THE BUILDABLE AREA OF THE LOT.						NO. 1	2 STORIES AND ROOF
	NO. 2	FLOOR AREA OF MAIN BUILDINGS MAY NOT EXCEED SIX TIMES THE BUILDABLE AREA OF THE LOT.						NO. 2	6 STORIES
	NO. 3	FLOOR AREA OF MAIN BUILDINGS MAY NOT EXCEED TEN TIMES THE BUILDABLE AREA OF THE LOT.						NO. 3	10 STORIES
	NO. 4	FLOOR AREA OF MAIN BUILDINGS MAY NOT EXCEED THIRTEEN TIMES THE BUILDABLE AREA OF THE LOT.						NO. 4	13 STORIES
NOTE: ALL INFORMATION GENERAL • FOR SPECIFIC DETAILS CHECK WITH DEPARTMENT OF BUILDING AND SAFETY									
CITY PLANNING COMMISSION LOS ANGELES JULY, 1962									

**TABLE B-4**  
**BUILDING DEMOLITIONS**  
**LOS ANGELES CENTRAL BUSINESS DISTRICT**  
**1930 — 1955**

<u>YEAR</u>	<u>NO. OF BUILDINGS</u>	<u>SQ. FT. OF LAND AREA</u>	<u>SQ. FT. GROSS BUILDING AREA</u>
1930	1,075	10,822,118	45,822,865
Demolitions (1931-1955)	272	2,235,633	4,941,484
1930 (Net After Demolitions)	803	8,586,485	40,881,381
New Construction (1931-1955)	42	823,813	3,959,646
1955 (Net After New Construction)	845	9,410,298	44,841,027
Over-All Change (1930-1955)	-230	-1,411,820	-981,838

SOURCE: Report on the Economic Phases of the Bunker Hill Renewal Project, H. A. Babcock, 1956.

**TABLE B-5**  
**PARKING AS A RESULT OF DEMOLITIONS**  
**DOWNTOWN LOS ANGELES<sup>1</sup>**  
**1956 — 1961**

<u>YEAR</u>	<u>TOTAL SPACES ADDED</u>	<u>SPACES FROM DEMOLITION</u>		<u>NET GAIN IN SPACES</u>
		<u>Number</u>	<u>Per Cent</u>	
1956	1,302	1,133	87.0	609
1957	1,374	930	67.7	1,349
1958	1,653	551	33.3	1,160
1959	1,105	732	66.2	866
1960	2,048	910	44.4	1,948
1961	1,852	1,305	70.5	1,743
Subtotal	9,334	5,561	59.6	7,675
Civic Center	83	—	—	83
TOTAL	9,417	5,561	59.2	7,758
1957-1961	8,032	4,428	55.2	7,066

<sup>1</sup>Includes Central Business District, Bunker Hill, Civic Center and Fringe Areas.

SOURCE: Los Angeles Downtown Business Men's Association.

TABLE B-6

LOS ANGELES C.B.D. PARKING  
GARAGES CONSTRUCTED SINCE 1955

SITE	BEGAN OPERATION	DEVELOPED		TYPE PARKING	CAPACITY
		By	For		
54	1960	Calif. Federal Savings	Public	A	350
55	1960	Welflower Office Bldg.	Public	S. P.	350
56	1956	So. Calif. Edison (Tele. Co.)	Employees	S. P.	107
57	1957	Los Angeles Times	Employees	S. P.	800
58	1957	—	Public	S. P.	50
59	1960	United Calif. Bank	Public	A	300
60	1962	Sec. 1st Natl. Bank	Customers	S. P.	84
61	1957	Burlington Building	Public	A	70
62	1962	Graff Textiles	Employees	S. P.	45
63	1955	Superior Oil Co.	Public	—	155
64	1961	State of Calif.	Employees	A & S. P.	900
65	1960	State of Calif.	Employees & Officials	S. P.	429
66	1960	City of L. A.	Officials & Employees	S. P.	375

Note: A — Attendant Parking; S. P. — Self-Parking.

SOURCE: Los Angeles Downtown Business Men's Association.

TABLE B-7

LOCATION, AVERAGE RENT, AND AGE OF BUILDINGS  
IN DOWNTOWN LOS ANGELES, 1958

<u>BUILDING</u>	<u>LOCATION</u>	<u>YEAR BUILT</u>	<u>SQ. FT. IN BUILDING</u>	<u>AVERAGE ANNUAL RENT</u>
Security	SE Cor. 5th & Spring	1907	140,500	12 Buildings 43-51 Years Old — Average Rent \$3.41 Per Sq. Ft.
Story	SE Cor. 6th & Broadway	1909	193,633	
Consolidated	SW Cor. 6th & Hill	1910	182,759	
Pacific So. West	NW Cor. 6th & Spring	1910	212,058	
Bartlett	NW Cor. 7th & Spring	1911	192,408	
Rowan	NE Cor. 5th & Spring	1912	157,400	
Hollingsworth	SE Cor. 6th & Hill	1913	135,221	
Brockman	SE Cor. 7th & Grand	1913	109,756	
Van Nuys	SW Cor. 7th & Spring	1913	293,838	
Chapman	NE Cor. 8th & Broadway	1913	185,866	
Park Center	6th Near Hill	1914	123,609	
Home Savings	NW Cor. 8th & Broadway	1915	59,890	
Warner Bros.	NW Cor. 7th & Hill	1920	72,799	18 Buildings 22-38 Years Old — Average Rent \$4.24 Per Sq. Ft.
510 West 6th St.	SW Cor. 6th & Olive	1921	222,865	
Loew's State	SW Cor. 7th & Broadway	1921	358,357	
617 West 7th St.	NE Cor. 7th & Hope	1923	205,669	
Broadway-Spring Arcade	Near 6th	1923	270,935	
Bank of America	NE Cor. 7th & Spring	1924	108,000	
Financial Center	SE Cor. 7th & Spring	1924	102,777	
National Oil	SW Cor. 6th & Grand	1925	132,273	
Petroleum Sec.	SW Cor. Olymp. & Flower	1925	239,954	
Roosevelt	NE Cor. 7th & Flower	1926	334,287	
530 West 6th St.	SE Cor. 6th & Grand	1926	174,069	
Quinby	NE Cor. 7th & Grand	1926	75,991	
Oviatt	Olive Near 6th	1927	114,374	
Foreman	SW Cor. 7th & Hill	1928	132,426	
Garfield	NW Cor. 8th & Hill	1929	92,980	
Equitable Life	NW Cor. 5th & Hill	1930	127,031	
Banker's	Hill Near 6th	1930	102,901	
Pacific Mutual	NE Cor. 6th & Grand (Remodeled 1936)	1908	455,000	
Gen. Petroleum	Flower near 6th	1948	498,963	6 Buildings 2-10 Years Old — Average Rent \$6.12 Per Sq. Ft.
Statler Office	Figueria Near 7th	1952	245,645	
Douglas Oil	SE Cor. 5th & Figueroa	1952	80,000	
Standard Fed. S&L	NW Cor. Grand & Wilshire	1953	61,389	
Lincoln Savings	SE Cor. 6th & Hope	1956	32,647	
Superior Oil	NE Cor. 6th & Flower	1956	204,062	

SOURCE: Bunker Hill Project, Rebuttal Statements, 1958.

**TABLE B-8**

**TYPICAL FEASIBILITY CALCULATION  
PARKING FACILITY LOCATED EIGHT BLOCKS  
NORTH OF HIGH-LAND-VALUE INTERSECTION  
DOWNTOWN LOS ANGELES**

<u>ITEM</u>	<u>AMOUNT</u>
Spaces	185
Parkers Per Space	5
Average Revenue Per Parker	\$ 0.75
Average Income Per Space Per Day	\$ 3.75
Total Daily Income	\$ 693.75
Monthly Income (20 Days Per Month)	\$13,875.00
Monthly Rent <sup>1</sup>	\$ 9,450.00
Gross Revenue Per Month (Total Income Minus Rent)	\$ 4,425.00

<sup>1</sup>\$4,500 plus 72 per cent of all gross monthly receipts exceeding \$7,000.  
SOURCE: Based on field observations, July, 1968.

**TABLE B-9**

**ANNUAL INCOME FROM PARKING LOTS  
LOS ANGELES**

<u>FISCAL YEAR</u>	<u>ANNUAL REVENUES</u>
1958-59	\$18,000,000
1957-58	19,880,000
1956-57	20,027,000
1959-60	19,440,000
1960-61	20,070,000
1961-62	20,840,000

Based on a fee of \$19.20 for up to \$6,000 annual gross income and an additional fee of \$3.20 for each \$1,000 of gross income.  
SOURCE: City of Los Angeles, Los Angeles Parking Authority.

**TABLE B-10****ANALYSIS OF DOWNTOWN PROPERTY SALES — HARTFORD  
1954 — 1959**

<u>YEAR</u>	<u>NUMBER OF SALES</u>	<u>TOTAL SALES PRICE</u>	<u>TOTAL ASSESSED VALUE</u>	<u>PERCENTAGE RATIO/SALES PRICE TO ASSESSED VALUE</u>
1954 _____	2	\$ 340,000	\$ 418,398	81.3
1955 _____	1	375,000	492,700	76.1
1956 _____	2	475,000	653,356	72.7
1957 _____	6	1,270,000	1,022,725	124.1
1958 _____	10	3,604,250	4,968,967	72.5
1959 _____	6	1,003,221	1,358,762	73.8
TOTAL _____	27	\$7,067,471	\$8,914,908	79.2

SOURCE: Research Department, Greater Hartford Chamber of Commerce, November 11, 1969.

**TABLE B-11****SUMMARY OF HARTFORD REDEVELOPMENT PROGRAM**

<u>PROJECT</u>	<u>YEAR APPROVED BY VOTERS</u>	<u>ACREAGE</u>	<u>GROSS PROJECT COST<sup>2</sup></u>	<u>STATUS</u>
1. Constitution Plaza _____	1956	10.8	\$ 5,415,057	In Operation
1(a). Plaza Extension _____	1958	3.6	2,090,000	In Operation
2. Windsor Street _____	1958-59	71.2	13,667,620	Demolition
3. Front-Talcott (Riverview) _____	1958	1.7	462,952	Demolition
4. Bushnell Plaza _____	1960	6.7	8,060,061	Advanced Planning
5. Trumbull Street _____	1961	13.9	12,844,000	Planning
6. Sheldon-Charter Oak _____	1961 <sup>1</sup>	171.0	21,777,000	Planning
Subtotal — (CBD) _____		278.9	\$64,316,690	
7. Underwood _____	1961	32.0	1,198,000	Planning
TOTAL _____		310.9	\$65,514,690	

<sup>1</sup>Voters approved \$250,000 for preparation of a redevelopment plan for this area.

<sup>2</sup>Gross project cost includes federal, state, and local government expenditures but excludes resale price of property acquired.

SOURCE: General Economic Information About Greater Hartford, Hartford Development Commission, 1962.



**TABLE B-12**

**ANTICIPATED CHANGES IN TAXABLES  
HARTFORD, CONNECTICUT  
1960-65**

<u>LOCATION</u>	<u>DISAPPEARANCE OF TAXABLES</u>	<u>APPEARANCE OF NEW TAXABLES</u>	<u>NET CHANGE</u>
East-West Expressway	\$ 8,450,000 <sup>1</sup>	\$ —	\$—8,450,000
1. Constitution Plaza and Phoenix Building.....	3,260,000	35,000,000	31,740,000
2. Windsor Street Project.....	5,500,000	12,000,000 <sup>2</sup>	6,500,000
3. Riverview Housing Project.....	3,170,000	4,665,000 <sup>3</sup>	1,495,000
4. Bushnell Plaza Project.....	2,870,000	6,810,000 <sup>4</sup>	3,940,000
5. Trumbull Center Project.....	4,700,000	865,000 <sup>2</sup>	—3,835,000
6. Sheldon-Charter Oak Project.....	2,110,000	5,000,000 <sup>2</sup>	2,890,000
Subtotal.....	\$30,060,000	\$64,340,000	\$ 34,280,000
7. Centinal Mall Project.....	2,200,000	3,660,000	1,460,000
<b>TOTAL.....</b>	<b>\$32,260,000</b>	<b>\$68,000,000</b>	<b>\$ 35,740,000</b>

<sup>1</sup>Includes \$716,000 in taxes.

<sup>2</sup>Partial redevelopment.

<sup>3</sup>Northernmost third of project.

<sup>4</sup>Complete.

SOURCE: Renewal Program for Downtown Hartford, Connecticut, Rogers, Taliaferro and Lamb, 1960.

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# INDEX

- Airport, parking, 67
- Baltimore, 51
- Benefits, to CBD land, 23
  - to the city, 88
- Case studies, 71
  - assessment, 78, 79, 93, 94
  - changes, 75, 94
  - characteristics, 79, 101
  - demolition of obsolete buildings, 78, 96
  - distribution of land use, 74, 94
  - economic influences, 74, 102
  - floor space, 75, 93
  - historical influences, 74
  - obsolescence, 78, 94
  - off-street parking, 81, 96
  - parking needs, 87, 101
  - parking rates, 86, 99
  - parking supply, 81, 83, 85, 96, 97, 99
  - parking trends, 79, 96
  - prospects for intensification, 89, 97, 111
  - regional setting, 71, 92
  - retail sales, 75, 92
  - similarities and differences, 109
  - spatial patterns, 82, 83, 99
  - traffic and parking magnitudes, 80
  - trends, 79, 96
- Characteristics, 3, 79, 96, 101
  - accumulation, 13
  - supply, 3, 82, 96
  - trip purpose, 9
  - usage, 9
  - walking distance, 9
- Constitution Plaza Garage, 107
- Costs, effects of, 35
  - comparisons, 38, 42, 45
  - development, 35
  - financing, 43
  - operating, 38, 39, 40, 41, 42, 43, 47, 48
- Cost-income comparison, 38
- Demands, 18, 19
  - generalized calibration, 19
- Design, 55, 68
  - combination facilities, 55
  - concepts, 55
  - connections, 56
  - coordination with freeways, 56
  - facility, 55, 68
  - self-parking, 55
  - standards, 57
- Development, 31, 51
  - costs, 35
  - cooperative, 67
  - economic, 74
  - historical, 74
  - opportunities for, 45
  - parking, 67
  - private, 45
  - programs, 51
  - public, 31
  - trends, 31, 51
- Downtown, costs of developments, 35
  - demands, 19
  - economics, 23
  - evaluation, 3
  - needs, 3, 18, 30
  - parking, 3, 23, 51, 61, 71, 109
  - stimulation of investment, 25
- Economic, benefits, 23, 28
  - downtown parking, 23, 31, 74, 88
  - equilibrium, 31
  - recent development, 102
  - values, 107
- Equilibrium, economic, 31
- Facility development, 31
- Financing, municipal, 43
  - private, 44
- G. Fox and Company Garage, 102
- Freeways, 56
- Future of downtown, 89, 109
- Garages, 56, 57, 102, 105, 107
  - design standards, 57
  - dimensions of units, 59
  - floor heights, 60
  - lighting intensity, 60
  - mechanical, 57
  - ramp, 57
  - ramp grades, 60
  - types, 56
  - underground, 56
- Hartford, 92
- Houston, 52
- Investment, 25
- Land, benefits of parking, 23
  - effects of cost, 35
  - use, 30, 88
- Lanes, entrance, 59
  - exit, 59
- Los Angeles, 71
- Minneapolis, 52
- Municipal Church Street Garage, 102
- Needs, 3, 18, 30, 87, 101
- Off-street, 26, 31, 51, 79, 96
  - direct values, 26
- Pigeon Hole Garage, 107
- Pittsburgh, 53
- Population, effects, 5
  - on facility types, 7
  - on supply, 5
- Rates, 8, 86, 99
- Revenues, 35, 38
- San Francisco, 54
- Spaces, 3, 18, 82, 87, 96, 101
- Transport terminals, 63
- Transportation planning, 61
  - terminals, 63
  - implications, 91
- Values, 26
- Washington, D. C., 55
- Zoning, 64
  - airport, 67
  - commercial, 66
  - institutional, 66
  - residential, 64